- - - Index to CONTENTS, October, 1933 - - -

The Index for the year 1933 will appear in the December issue

Bridges and Viaducts
Federal Highway Funds for Streets and Bridges Within City Limits..... 11
Repairing Old State and County Bridges.. 47
New Bridge and Viaduct at Westfield, Mass. 87

City Planning and Zoning
The Challenge of the Future to the City of Medium Size..... 67
Suburbanism "Come of Age"..... 67
Zoning and Planning Notes..... 73

Civic and Commercial Organizations
Chamber of Commerce Promoted Water-Improvements 7
Citizens to the Rescue..... 42
Federal Public Works from the Chamber of Commerce Viewpoint..... 48

Contracts
Bureau of Contract Information..... 83

Conventions
New Officers of the United States Conference of Mayors..... 50
City Planners and American Civic Association to Meet in Joint Conference.... 62
When and Where..... 77
City Managers Hold Exceptionally Successful Convention 77

Engineering
Engineering Clinic Formed..... 83

Finance
Federal Highway Funds for Streets and Bridges Within City Limits..... 11
The Crisis in the Property Tax..... 39
The British System of Local Taxation.... 40
A Rejoinder by Professor Griffith..... 41
Broadcasts to Discuss Municipal Finance.. 41
Citizens to the Rescue..... 42
Storm-Sewer Assessments..... 56
NRA Codes and Municipal Tax Rates.... 60
Comparative Ratings of Local Governmental Costs 66
The Municipal Bond Market..... 66
Over-the-Counter Sales of Municipal Bonds 68

Fire Prevention and Control
To Raise the Standards of the Fire-Fighting Profession 17

Forward Steps
Items Contributed by Officials..... 65

Government and Administration
New Offices of the United States Conference of Mayors..... 50
Home Rule for Texas Counties by Constitutional Amendment 65

Housing
Have We Actually a Housing Surplus?.. 63
Ohio Enacts a "Housing Authority" Law.. 63

Legal Decisions
The City's Legal Rights and Duties..... 71

News and Illustrations
Hints for Officials..... 79

Outdoor Lighting
New Bridge and Viaduct at Westfield.... 87
The Illumination of Golf Courses..... 89

Parks and Recreation
Free-Time Activities Councils Urged..... 53
The Night-Time Illumination of Golf Courses 89

Police and Prisons
Partisan Interference with Police Efficiency 17
New Radio Distribution for Sing Sing.. 17

Power Plants
Electric Rates Announced by Tennessee Valley Authority 66

Publications
Book and Pamphlet Notices..... 75

FULL STEAM AHEAD

towards the port of municipal progress and national prosperity can now be achieved through effective cooperation of city and state officials with the Federal Emergency Administration of Public Works.

(See front cover and pages 5, 11, 45, 46, 48, 58, 65 of this issue.)

VOL. XLVIII
No. 10

OCTOBER
1933

The American City

ISSUED MONTHLY BY THE
American City Magazine Corporation
470 Fourth Ave., New York

EDGAR J. BUTTENHEIM, Pres. and Mgr.
HAROLD S. BUTTENHEIM, Editor
THEODORE R. KENDALL
Secretary and Engineering Editor
M. V. FULLER
Associate Editor
HERBERT K. SAXE
Treasurer
PRENTICE C. FORD, Asst. to President
MYRON MacLEOD, Advertising Manager

BRANCH OFFICES
Daily News Building, Chicago
TOM DIX, Vice-President
642 Hanna Building, Cleveland
GEORGE S. CONOVER, Manager
402 Monadnock Bldg., San Francisco
DUNCAN A. SCOTT, Representative

Subscription, $2 per annum
($3 to Canada and foreign countries)
Single copies, 35c
Back numbers available

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879.
Printed in U. S. A.

In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

Public Works
A Challenge to the Mayors of America... 5
Federal Highway Funds for Streets and Bridges Within City Limits..... 11
PWA Appoints Technical Board of Review 45
The Public Works Fund in Relation to Street and Highway Pavements..... 46
Federal Public Works from the Chamber of Commerce Viewpoint..... 48
NIRA Aids Roadside Improvement and Beautification 65
30 Per Cent Grants to Cities Which Finance Their Own Public Works.... 58

Radio
New Radio Distribution for Sing Sing.... 17
Broadcasts to Discuss Municipal Finance.. 41

Roadside Beautification
NIRA Aids Roadside Improvement and Beautification 65

Schools
Good Schools in Bad Times..... 66

Sewers and Sewage Disposal
Checking Infiltration into a Sewer System. 13
Control of Odors..... 13
A Sewage Treatment Plant among Attractive Surroundings 43
Storm-Sewer Assessments 56

Snow Removal
Snow-Removal Experience in American Municipalities 59

Streets and Highways
Federal Highway Funds for Streets Within City Limits 11
The Public Works Fund in Relation to Street and Highway Pavements..... 46
Welfare Labor Producing 285 Miles of Highway in Onondaga County..... 61
Improving Macadam Pavements..... 64
A Stable Flexible Non-Skid Pavement.... 81
Using Trucks for Maintenance and Fine Grade Rolling 81
A Power Spray Outfit for Curing Concrete Roads 83
A Road Tar Research Program..... 83
Improved Bituminous Distributors..... 85

Traffic
Highway Department Suggests Ordinance for Street Safety..... 17
Emergency Work Bureau Installs Directional Signs 66
Traffic Control and Facilitation..... 69
Fire-Stop Traffic Signals..... 83
Traffic Markers with Reflector Buttons.... 85

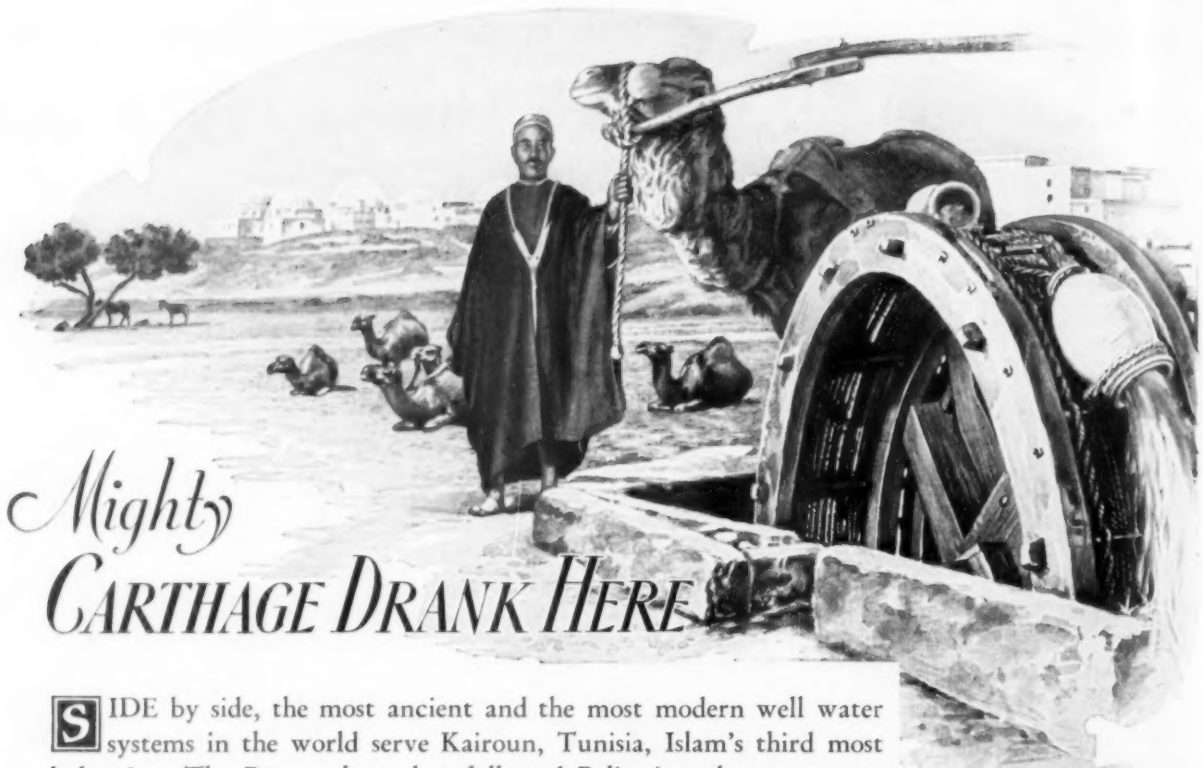
Unemployment Relief
The Alternative to the Dole..... 55
NRA Codes and Municipal Tax Rates.... 60
Welfare Labor Producing 285 Miles of Highway in Onondaga County..... 61
Emergency Work Bureau Installs Directional Signs 66

Waste Collection and Disposal
In Bremerton, Wash..... 15
Controlled Tipping 15
Collection Methods in England..... 15
Garbage Disposal in Milwaukee..... 49
National Municipal Incinerator Association 85

Water Works and Water Supply
Chamber of Commerce Promoted Water Improvement 7
Joint Leaks in Water Mains..... 7
Improving Coagulation 7
Lime-Soda Water-Softening Plant..... 7
Meters Check Losses..... 9
Reduction of Corrosion in Water Pipe.. 51
Crossing a Tidal Stream with a Water Main 54
New Medium-Pressure Gate Valves..... 79
Automatic Zeolite Water Softener..... 79
A New Water-Level Recorder..... 81
Installation of Couplings in Washington.. 83

See pages 19, 20, 21, 75, for notices of catalogs and publications on municipal and civic subjects

For Index to Advertisements see page 94



Mighty CARTHAGE DRANK HERE

SIDE by side, the most ancient and the most modern well water systems in the world serve Kairoun, Tunisia, Islam's third most holy city. The Roman host that followed Belisarius, the conqueror, built the well of Sidi-el-Hani in 625 A. D. so that its water could help quench the thirst of glorious and mighty Carthage. Today Kairoun and its seven-domed mosque overlook all that is left of the ruins of Carthage . . . *but the well still serves.* And beside it, also serving Kairoun, are modern Layne Pumps and Gravel-Wall Wells, first choice of the French government for service in its North African colonies. Write now for Layne's free booklet, "WATER OR NO PAY," that tells why Layne guarantees *more* water at *less* cost, no matter in what part of the world you live.

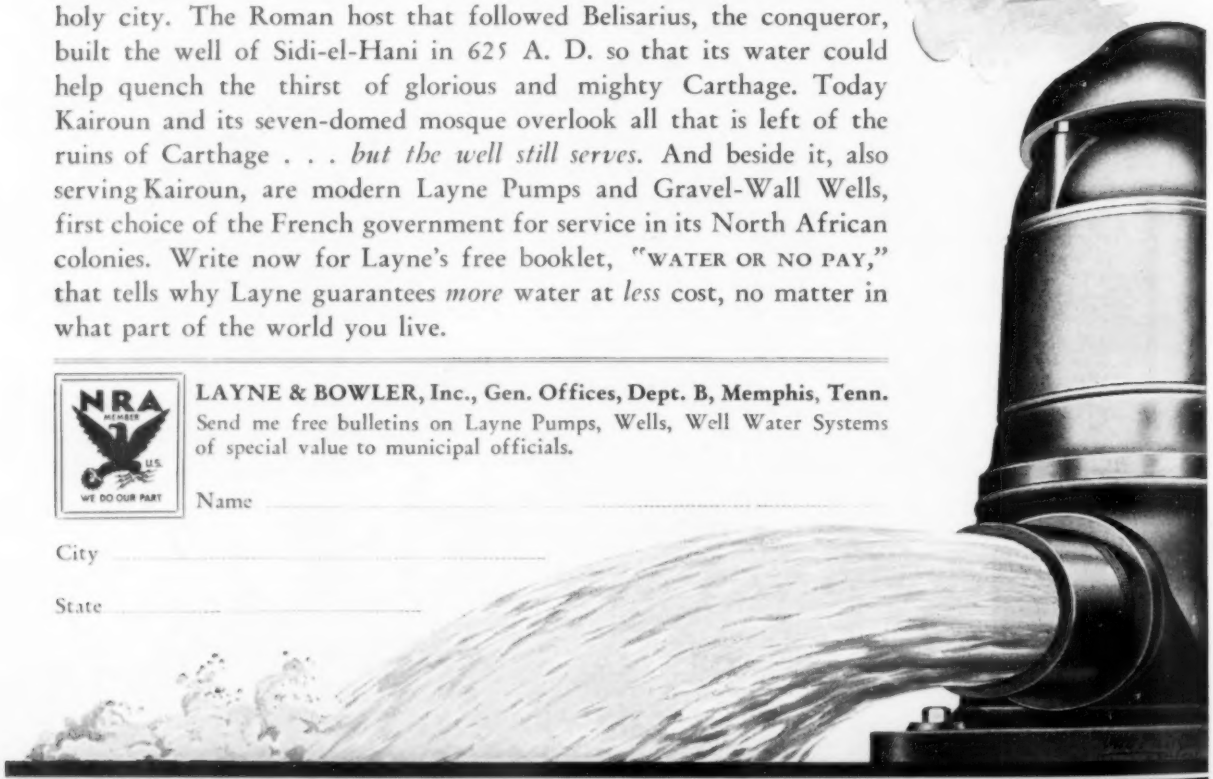
NRA MEMBER U.S. WE DO OUR PART

LAYNE & BOWLER, Inc., Gen. Offices, Dept. B, Memphis, Tenn.
Send me free bulletins on Layne Pumps, Wells, Well Water Systems of special value to municipal officials.

Name .....

City .....

State .....



LAYNE PUMPS
AND WELL WATER SYSTEMS

A Challenge to the Mayors of America

By Harold L. Ickes, Secretary of the Interior and Federal Emergency Administrator of Public Works

THE Public Works Program, contemplating as it does the expenditure of funds in excess of $1,750,000,000 for state and municipal projects [out of the $3,300,000,000 allotted to public works under the National Industrial Recovery Act], offers the greatest opportunity for municipal improvements in the history of any country. We are willing to advance you as an outright gift 30 per cent of your outlay for labor and material on an approved plan. We ask you to pay for the balance of the project. But we are willing to help you to finance your share. We will advance you the remaining 70 per cent upon approved security, and by approved security I don't mean that we will be as finicky about the security that you may offer as would be the investment bankers with whom you are accustomed to deal. We will lend you this 70 per cent at 4 per cent interest and permit you to amortize it over a period not to exceed 30 years.

Here is an opportunity to build necessary and desirable public works on more favorable terms than you have ever had before or than you may ever have again. Do you need new water works, or an extension of your present plant? Do you want a new or improved sewerage system? Do you require bridges or viaducts or public buildings or roads or new schools? These things and others you may have on unbelievably generous terms.

Naturally, the purpose of the public works program is not merely to do work for the sake of doing the work. We want to increase buying power because it is realized that without increasing buying power our recovery program will fail. In this the municipalities are as much interested as the Federal Government.

Two Fine Results with One Effort

If at the same time that we increase buying power we build useful and socially desirable public works, we are accomplishing two fine results by the same effort. I need not point out to you that for every hundred thousand men at work on public works projects there are at least an equal number at work back of the lines in saw mills, in steel mills, in factories, in quarries, and on railroads, producing materials and performing services necessary to supply the men on actual projects with what they need for their work. And as these men on the works and back of the lines acquire buying power, they are in a position to increase the buying power of others. They will be buying more clothing. They will be sending their children to school. They will be able to afford more and better food. A new automobile will not be beyond their hopes. They will want to repaint their houses and repair them. Thus, they will be helping turn the wheels of industry, giving employment to those who in turn will give further employment to others, until the recovery movement will be able to keep moving of its own momentum and the stimulus which we are now ready and willing to provide in the way of public works will no longer be necessary.

Complaints have come to the Public Works Administration from several quarters that the minimum wages stipulated to be paid on public works projects are too high. Those who voice this criticism, as I see it, do not have a proper view of the situation. Our avowed object is to increase buying power. If we shortsightedly refrain from increasing buying power for one group because we cannot simultaneously increase all groups proportionately, we will not accomplish our objective and we will all be left in the slough of economic despond. All of us ought to be willing to see the other fellow achieve a legitimate and necessary increase in his income even if we ourselves are not immediately or directly benefited. Our turn will inevitably come.

The sum of approximately $1,600,000,000 has already been allocated by the Public Works Administration. The major portion of these allocations has gone for Federal projects, and the reason for this is not far to seek. We knew our own Federal projects. We had our engineers and our staffs ready to turn loose on them. They could be undertaken with a minimum of delay and with an assurance of a lack of waste and misapplication of funds. Moreover, we could authorize these Federal projects while your municipalities were preparing your projects.

To Speed Up Municipal Projects

Latterly, we have been devoting the major part of our attention to municipal projects. We want to get these under way without loss of time. We want them to be as widespread as possible and to provide the maximum of employment.

We are not being technical. We are not wound about with red tape. Those who cry out about "red tape," in some instances at least, are themselves entangled in red tape. We are willing to give a municipality the benefit of the doubt. We do not even ask that any municipal project be brought to us in perfect engineering, legal and financial form before approving it. We have adopted a system of tentative allocations of funds. On my motion, the Special Board for Public Works, about a month ago, adopted a resolution as follows:

"Resolved, That upon a proper prima facie showing that a proposed state or municipal public works project is socially desirable, is satisfactory from an engineering point of view, and can be financed under the law, the Public Works Administration may make an allocation of the money required for such project on the condition that not later than thirty days after such allocation, the financial and engineering features of said project be worked out and a final contract, satisfactory to the Administrator of Public Works, be executed, failing which the tentative allocation shall be without effect."

Here is concrete evidence of our willingness to proceed without loss of time and with a minimum of technicality. Come to us with a prima facie case and we will set aside the money for you. Then you can proceed without delay to supply us with the necessary explicit engineering, legal and financial details. You have all of these in your files. At least you ought to have them. We are more liberal than any lender on a large scale since the beginning of the world ever thought of being, but we are not dropping taxpayers' money into the hat of a blind man. You ought to know whether the works you propose are desirable and possible from a social, legal, financial and engineering point of view. If you do know, there is no good reason why you should not quickly take us into your confidence. If you don't know or can't demonstrate it and still demand that money be given you, good sportsmanship requires that you do not raise the cry of "red tape" against us. Bring us your projects supported by the facts that are undoubtedly within your knowledge and you will get prompt action.

This Public Works Program is a great cooperative movement. Under the swift and sure leadership of President Roosevelt, the Federal Government is cooperating with the states and with municipalities; states and municipalities are cooperating with each other. If we can all pull together in the general interest, we will definitely turn this tide of depression and come out of it with a renewed self-confidence, a mutual respect, and a spiritual acceleration that we have not felt since the war.

—From an address, September 23, 1933, before the United States Conference of Mayors.

Beauty . . . Service . . . Economy

The Colonial design combines beauty and utility. Its pleasing appearance allows a city to take advantage of elevated water storage in its waterworks system, even though the storage is required in a high-class residential section.

The installation shown above, which is located at Tallahassee, Fla., has received much favorable comment. It has a capacity of 400,000 gallons. The total range in head between the upper and lower water levels in the tank is only 24 feet.

This shallow depth improves service by maintaining uniform pressure in the system. It introduces economies which reduce operating costs materially. Write our nearest office for information.

CHICAGO BRIDGE & IRON WORKS

Chicago.....2127 Old Colony Bldg.
New York.....3108 Hudson Terminal Bldg.
Cleveland.....2236 Rockefeller Bldg.
Detroit.....1501 Lafayette Bldg.
Philadelphia.....1616 "1700" Walnut Street Bldg.
Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 N. Fiftieth Street

Dallas.....1206 Burt Bldg.
San Francisco.....1033 Rialto Bldg.
Seattle.....4343 Smith Tower
Houston.....2919 Main St.
Tulsa.....1625 Thompson Bldg.
Los Angeles.....1403 Wm. Fox Bldg.
Havana, Cuba.....Edificio Abreu 402

B-359

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water Supply and Purification

Water Works News and Reviews

Chamber of Commerce Promoted Water Improvements

WITH a threatened State Health Department ban upon the use of the river water supply, which was becoming increasingly polluted from year to year owing to the growth of the community and greater volumes of industrial waste, the Chamber of Commerce of Youngstown, Ohio, aided in securing state legislation which permitted the creation of a sanitary district whereby one or more contiguous communities might combine for control of sanitary conditions or for a domestic water supply. The Chamber of Commerce financed the securing of the necessary signatures through the circulation of a petition and paid the court costs and other incidental expenses attending the organizing of the Sanitary District.

The District, which was finally declared necessary by the Court, was created six years ago and has been active in a $9,000,000 project since that time. The water works are considered among the finest in the country and have just begun delivering a pure, soft water to consumers throughout the District, benefitting every individual in the community through substantial savings in the cost of water softeners, soaps, various powders and mechanical appliances which are estimated by experts as saving the citizens about $500,000 annually.

FRED A. LA BELLE,
Executive Secretary, Youngstown, Ohio, Chamber of Commerce.

Joint Leaks in Water Mains

JOINT leaks, the most common type of main leakage found, are of two types; those where the jointing material has been forced out of the joint or has deteriorated, and those where the joint has pulled apart. The first type is caused by careless preparation, pouring or calking. Improper preparation of jointing compounds destroys their qualities. A poor joint may be caused by not having enough lead in the ladle to completely fill the joint, or by an obstruction which prevents the hot lead from running properly. A bad joint is sometimes due to poor yarning which allows the jointing material to escape into the pipe, not only requiring an excess of material, but forming an obstruction in the pipe. If such a joint is at a valve, the material may prevent the proper operation of the valve. Calking affects the lead only for a limited distance from the outside end of the bell. Owing to its contraction in cooling, there is no close bond between the lead and the pipe, so that, unless the calking is properly done, the whole ring of lead may start, allowing considerable water to escape. This movement is of course limited by the groove in the bell and the head on the spigot.

The cause of the second type of joint leak, where the pipe is pulled apart, usually is faulty construction. A settlement on either or both sides of a joint may open the top, or a settlement under the joint may open the bottom. Entire separation of a joint is rare in a straight pipe unless due to a washout or similar accident; but at bends, joints are sometimes pulled apart because of improper bracing. The same thing may happen in short branches and blow-offs not sufficiently braced.

—From a paper presented by ALFRED E. SKINNER, Western Manager, The Pitometer Co., before the American Water Works Association.

Improving Coagulation

AS a result of several years of intensive study and experimental work in both the laboratory and the plant operation of the Richmond, Va., filter plant, certain facts have been established and others confirmed, as follows:

1. A minimum amount of coagulant is required for floc formation in a given water; and no amount or kind of mechanical treatment can overcome the failure to provide this minimum amount of coagulant.

2. There is but one optimum quantity of coagulant required for a given water. The use of more or less than this optimum results in less successful coagulation and plant operation.

3. This optimum is much more sharply defined in cold than in warm water, probably being most pointed at that temperature at which the maximum density of the water occurs.

4. A sudden, even though very slight, change of pH immediately before the application of the coagulant materially assists effective chemical reaction. With Richmond raw water this usually requires acid in summer and alkaline addition in winter.

5. The losses resulting from inadequate mechanical treatment of the water after the application of the coagulant were far greater than usually realized.

6. Probably the ideal mechanical treatment consists of:

(a) An immediate and thorough mixing of the applied coagulant. In many water aeration here should be avoided.

(b) The floc must be kept in suspension a sufficient time.

(c) While in suspension the floc must effectively, and under control as to violence, sweep throughout the mass of water.

(d) A proper return of a part of the settled floc and turbidity.

—From a paper by MARSDEN C. SMITH, Engineer, Bureau of Water and Electricity, Richmond, Va., presented before the North Carolina Section, American Water Works Association.

Requirements of a Lime-Soda Water-Softening Plant

MODERN lime or lime soda water-softening plants should be designed (1) to require a minimum amount of labor in their operation; (2) to be practically dust-proof; (3) to provide for an accurate and uniform application of the softening chemicals, thus insuring a minimum of variation in the hardness of the softened water; (4) to make possible the reduction of hardness to practically the theoretical solubility limit; (5) to produce water in chemical balance and thereby eliminate the building-up of incrustation or deposits in the distribution system, or red-water troubles in hot-water heating systems. A modern lime or lime soda water-softening plant should also be capable of softening muddy water as successfully as clear water, and should eliminate entirely from the softened water all turbidity, practically all color, free carbonic acid, iron, manganese, hydrogen sulfide, harmful bacteria, objectionable tastes, and odors.

—From a paper on municipal water softening by CHARLES P. HOOVER, Chemist in Charge, Water Softening and Purification Works, Columbus, Ohio, presented before the Wisconsin Section, American Water Works Association.

HISTORY OF WATER SUPPLY

Progress Toward Purity

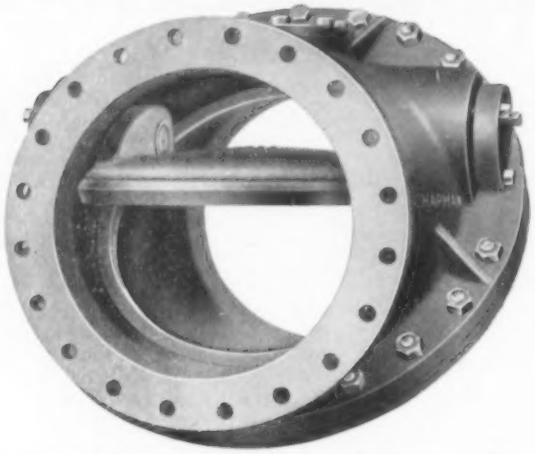
EVERY SCHOOLBOY now knows—or should know—that it is unsafe to drink from even the pleasantest rivers and streams. But we all know that we can fill a glass from the nearest faucet or tap, with never a qualm or fear.

Behind this simple contrast lies more than a hundred years of ceaseless effort and experiment. It was in 1829 that the first filtration plant was built in London. Its purpose was to rid the water of sediment and slime; but, although the germ theory of disease was yet unknown, the filter also served to free the water of many dangerous bacteria.

Nowadays, in cities depending on surface supplies, the water is not only filtered by the most efficient modern methods; it is also sterilized. And at every stage in the process of purification the water is bacteriologically tested with the most rigid exactitude.

NO. 10 OF A SERIES OF WATER ADVERTISEMENTS USED IN LOCAL NEWSPAPERS BY THE AMERICAN WATER WORKS & ELECTRIC CO.

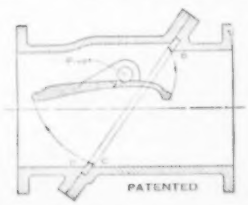
Pipe line Capacities INCREASED



by Chapman Non-slam CHECK VALVES

A SUPERINTENDENT, who was considering plans for replacing certain pipe lines to increase capacity, first tried out Chapman Non-Slam Check Valves in the system. They greatly reduced the head losses caused by check valves previously used, increased the capacity of the lines, and as a result, no new piping was needed.

The design of the CHAPMAN Valve, with its *Balanced Disc*, cuts head losses down to approximately one-fourth of those caused by the ordinary type of check valve. Not only does this increase pipe line capacity, but when these valves are installed on pump discharge lines, they also effect substantial power savings.



A cushioning effect, obtained by forcing the short flap of the disc against the stream, prevents slamming

CHAPMAN NON-SLAM Check Valves do not slam and practically eliminate wear of parts. The many important features of these valves are fully described in a booklet that we shall be glad to send you upon request. *Write for it today.*

THE CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD, MASSACHUSETTS

"the repairs are less than we anticipated"

Thus writes one McIntosh & Seymour Diesel Engine user regarding maintenance.

Others have written:

"Our repairs are next to nothing."

"Our McIntosh engines give perfect service, looks like they should last fifteen or twenty years."

"These engines have proven to be of great efficiency and economy in operation and maintenance. Repair bills have been very light."

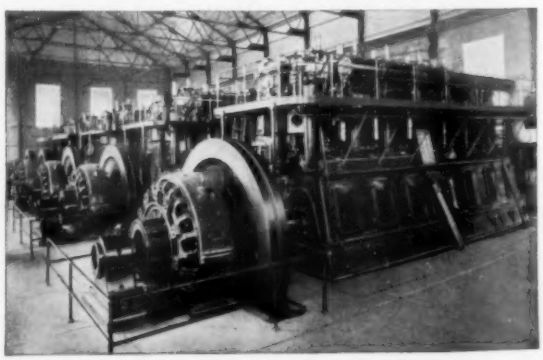
"Our total maintenance and repair expenses amount to less than three-tenth per cent during each year. Our engines are making most remarkable record in our plant as to reliability and efficiency."

"Adjustments and repairs . . . . . None."

"The statement below does not contain maintenance charges since there are none on the Diesel."

"Our maintenance has been practically nothing."

Would you like a set of facsimile copies of the above statements together with a large number of other equally interesting statements regarding maintenance? Write us.



McIntosh & Seymour Corp.

Division of American Locomotive Company

Main Offices and Works: Auburn, N. Y.

District Offices

New York Washington, D. C. Chicago Tulsa, Okla.
Omaha, Nebr. Houston, Texas San Francisco

Meters Check Losses

Reports on the Services of Water Meters

Morganfield, Ky.

MORGANFIELD has been 100 per cent metered since 1924. In 1930 the population was 2,600, all services were metered, and the average daily consumption was 25 gallons per capita. In 1932 the population had decreased to 2,551, all the services were metered, and the average daily consumption had dropped to 20 gallons per capita. There is no record of the consumption before 1924. —DAVE DETRAZ, Superintendent of Water Works.

Rayne, La.

THE present population of Rayne is 3,730, and 100 per cent of the domestic and industrial services are metered. The system was metered completely ten years ago and, while no exact figures are available showing the saving effected in water consumption and the operation of the plant, it has made a great difference in the quantity of water pumped.—E. BERTRANT, Superintendent, Water Department.

Fitchburg, Mass.

THE story of Fitchburg's metering program might well be titled "From 4,000,000 to 4,000,000 Gallons Daily Consumption." In 1900, when the domestic system was 75 per cent metered and the industrial services 100 per cent metered, the average daily consumption was 4,000,000 gallons. In 1910, with a population of 40,000, the domestic services were 77 per cent metered and the industrial services wholly metered, and the average daily consumption had increased to 4,125,000 gallons. In 1920 the population had increased to 41,000, the domestic services to 80 per cent metered, and the consumption to 4,500,000 gallons per day. In 1930 the population had increased to 42,000, the domestic services were 99 per cent metered, and the average daily consumption was 4,400,000. In 1932, with a population of 40,000 and domestic services 99 per cent metered and, as before, the industrial services 100 per cent metered, the consumption had been reduced to 4,000,000 gallons daily.—A. W. F. BROWN, Superintendent.

Quincy, Mass.

THE metering of services in Quincy has risen from 3 per cent in 1900 to 100 per cent in 1932. In 1900 the population was 23,899, 3 per cent of the services were metered, and the average daily consumption per capita was 69 gallons. In 1910, with an increase of population to 32,642, and with 36 per cent of the services metered, the average daily consumption was 88 gallons per capita. In 1920 the population was 48,800, with 92 per cent of the services metered, and the consumption had risen to 93 gallons per capita daily, owing to heavy increases in industrial consumption. In 1930 the population had jumped to 72,900, with 97 per cent of the services metered, controlling the consumption so that it was reduced to 76 gallons per capita daily. In 1932 the population was 74,000, and 100 per cent of the services were metered, reducing the average daily consumption to 69 gallons per capita.—J. G. WHITMAN, Superintendent.

Detroit, Mich.

WHEN the city of Detroit began earnestly to force meters on all services in 1915, the consumption per capita was 162 gallons daily. This was reduced to 124 gallons per day in 1928. In 1929 the per capita consumption was 135.6 gallons, and in 1930, 138 gallons. There was a consistent reduction in per capita consumption in 1928. The actual cash savings of this reduction have not been determined. Comparable figures for the years which have been noted in other reports are as follows: The population in 1910 was 465,766, 10 per cent of the services were metered, and the average daily consumption was 176 gallons per capita. In 1920 the population was 993,739, the services were 96.68 per cent metered, and the consumption was 142.6 gallons per capita daily. In 1930 the population was 1,573,985, the services were 99.48 per cent metered, and the consumption was 138 gallons per capita daily. In 1932, the population was 1,339,125, the services were 99.81 per cent metered, and the daily consumption was 131.9 gallons per capita.—D. GROBBEL, Office Manager, Water Department.

Hastings, Mich.

WHILE no figures are available to show accurately the savings which have been effected by metering practically all services in Hastings, it is felt that 30 per cent fairly accurately represents the actual saving. In 1900 the population of Hastings was 5,132, 10 per cent of the domestic services were metered, and none of the industrial services. At that time the per capita consumption was 180 gallons daily. In 1932 the population was 5,118, 98 per cent of the domestic services and 100 per cent of the industrial services were metered, and the average daily consumption had dropped to 80 gallons per capita.—BEPT SPARKE, City Engineer.

Rochester, Minn.

PRACTICALLY all services in Rochester have been metered since installation, but no records are available on file prior to 1917. In 1920 the population was 13,722, the domestic services were 97 per cent metered, the industrial services were 100 per cent metered, and the per capita consumption was 70 gallons daily. In 1930 the population was 20,626, the domestic services were 98 per cent metered, the industrial services were 100 per cent metered, and the consumption was 76 gallons per capita daily. In 1932 the population was 20,626, the domestic services were 99 per cent metered, the industrial services were 100 per cent metered, and the average daily consumption was 77 gallons per capita.—EUGENE SCHWARZ, Superintendent.

Glendive, Mont.

LAWN and garden irrigation was restricted to four hours per day until the city was almost 100 per cent metered. Without metering, the per capita consumption would have been almost double if very strict irrigation regulations had not been enforced. The Water Department of Glendive was established in 1906, but no data are available prior to 1920. In 1920 the population of Glendive was 3,800, the domestic services were 44 per cent metered, the industrial services were 100 per cent metered, and the average daily consumption was 93 gallons per capita. In 1930 the population was 4,600, the domestic services were 97 per cent metered, the industrial services were 100 per cent metered, and the average daily consumption was 101 gallons per capita. In 1932 the population was 4,634, the domestic services were 97 per cent metered, the industrial services were 100 per cent metered, and the per capita consumption was 100 gallons daily.—CLAUDE W. EYER, Superintendent of Water.

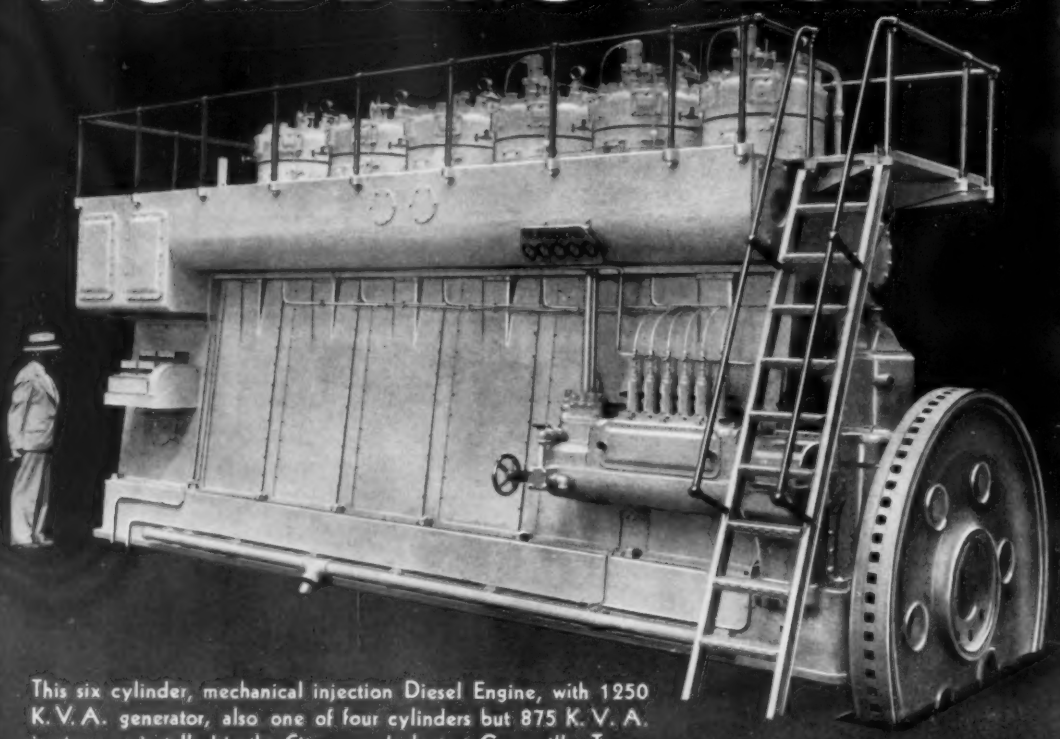
Sidney, Mont.

THE city of Sidney has always been 99 per cent metered. In 1930 the population was 2,209, and the daily consumption was 273.7 gallons per capita. The population was the same in 1932, and the consumption had dropped to 231.3 gallons per capita daily. The larger consumption in 1930 is believed to be due to the dry season and watering.—B. F. MERCER, Water Commissioner.

Fairbury, Nebr.

THE water system of Fairbury has been 100 per cent metered since 1900. In 1930 the population was 6,180, and the per capita consumption, based on domestic service, 108 gallons daily, and 130 if the water used by the Rock Island Railroad Company is included. In 1932, with practically the same population, the domestic consumption was 100 gallons per capita, and the total consumption 125 gallons per capita daily.—R. B. BOALS, Water Commissioner.

Another Municipality Installs
NORDBERG DIESELS



This six cylinder, mechanical injection Diesel Engine, with 1250 K.V.A. generator, also one of four cylinders but 875 K.V.A. in size, are installed in the City-owned plant at Greenville, Texas.

Here is another city that has turned to the Diesel Engine as the most suitable type of power unit for municipal service. Like many other cities where conditions are similar, Greenville, Texas, has installed modern Nordberg Diesel Engines to replace its steam equipment.

In many installations, not only in municipal plants but serving other industries as well, these engines have demonstrated their ability to produce power cheaply. Besides reducing the cost of power and making greater profits possible, they assure a dependability that is unsurpassed.

Two-cycle engines, arranged for either mechanical or air injection, can be furnished in sizes from 750 horsepower, upward. Four-cycle engines are built in sizes from 150 to 1000 horsepower. There is a Nordberg Diesel of a size and type suited for your needs. May we acquaint you more fully with them?

NORDBERG MFG. CO. MILWAUKEE, WISCONSIN

NEW YORK 60 East 42nd Street
CLEVELAND Rockefeller Bldg.
KANSAS CITY 2 West 62nd Street
LOS ANGELES Subway Term. Bldg.

Federal Highway Funds for Streets and Bridges Within City Limits

ON September 20 THE AMERICAN CITY addressed the following letter to the Chief Engineers of the 48 State Highway Departments:

"May we have a brief statement from you as to the extent to which the highway funds recently apportioned to your state by the Federal Emergency Administration of Public Works will be used for improvement of traffic conditions *within city limits.*

"We are requesting this information because of the widespread interest among municipal officials in grade-crossing elimination, the widening of narrow bridges and roadways, the replacement of unsafe bridges, and the construction of facilities to improve accessibility and the free flow of traffic—all of which, as you know, are specifically authorized in the National Industrial Recovery Act as proper uses of Federal aid highway funds."

Up to the time this issue went to press, replies were received from 22 states. A brief summary follows:

CALIFORNIA, C. H. Purcell, State Highway Engineer.—"Of the total amount of funds apportioned to California, the sum of $3,901,838 was approved for expenditure within incorporated cities. The projects to be undertaken include the opening of new traffic arteries; the paving, widening, repaving and improving of existing city streets; the reconstruction of inadequate railroad grade separations and street grade separations; the reconstruction of bridges; and other street and highway improvements."

COLORADO, Charles D. Vail, State Highway Engineer.—"$1,718,883, which is 25 per cent of total."

CONNECTICUT, John A. Macdonald, State Highway Commissioner.—"Under the $2,875,000 which is apportioned to the state of Connecticut, the state has provided for approximately 28 per cent, or $802,407, to be spent into and through municipalities. This probably will be somewhat revised at a later date, as the projects will be shortened in some cases and lengthened in others, but in no case will it be less than the 25 per cent required by the Act."

DELAWARE, W. W. Mack, Chief Engineer, State Highway Department.—"Since 1919, Delaware has made a practice of building through towns and cities where they were a part of state highway routes. We do not have, therefore, as much necessity for this work as is found in some other localities, but we are planning to do such work as is required by traffic conditions."

IDAHO, G. E. McKelvey, Commissioner of Public Works.—Grading and rock surfacing. 7.8 miles, $198,500; paving, oiling and bituminous macadam, 10.01 miles, $270,700; bridge and grade separations (8), $608,000; total, $1,077,200."

KANSAS, W. V. Buck, State Highway Engineer.—"We will spend some $2,500,000 on improvements within city limits."

MISSOURI, T. H. Cutler, Chief Engineer, State Highway Department.—About $3,000,000 of Missouri's NIRA funds will be spent in cities with a population of more than 2,500 where the present road law will not permit construction with highway funds. There are more than 60 cities of this class in the state."

MONTANA, W. O. Whipps, Administrative Engineer, Highway Commission.—"From present indications it is probable that our work within municipalities will approximate something over $1,000,000."

NEBRASKA, R. L. Cochran, State Engineer.—"We have outlined projects in a tentative program approximating about $1,250,000 for work within the limits of municipalities in this state. This includes widening in some cases, of existing routes; however, most generally this work is made up of standard paving sections for two lanes of traffic contiguous to Federal aid projects which either have been or are being constructed outside of municipalities."

NEVADA, S. C. Durkee, State Highway Engineer.—"This state has apportioned a sum of $500,050.87 for highway construction within cities, the work to consist mainly of paving, resurfacing and construction of curbs and gutters."

NEW HAMPSHIRE, Daniel H. Dickinson, Chief Engineer, Highway Department.—"This state is spending under the provisions of the NIRA approximately $500,000 for street construction in some ten municipalities scattered throughout the state. This work consists wholly of the reconstruction of the present worn-out city streets."

NEW MEXICO, G. D. Macy, State Highway Engineer.—"The New Mexico Highway Department has prepared a program of municipal highway improvements which has been approved for construction."

NORTH CAROLINA, John D. Waldrop, State Highway Engineer.—"The total amount of highway funds allocated to this state is $9,522,293, and it is planned to spend approximately $2,380,000 inside the various municipalities throughout the state. This will be spent entirely on the extensions of the Federal aid highway system into the municipalities. These funds will be used in rebuilding the streets on our main highways which are in bad condition, the construction of pavement on such streets which have not been improved, the building of alternate routes through the towns to eliminate traffic congestion and the elimination and protection of grade crossings."

OHIO, C. L. Moyer, Planning Engineer, Department of Highways.—"$4,645,378, or 30 per cent, of Ohio's allotment, has been assigned for municipal projects, including grade eliminations, landscaping, new pavements, old pavements reconstructed, and old pavements resurfaced and widened."

PENNSYLVANIA, Samuel Eckels, Chief Engineer, Department of Highways.—"Pennsylvania's total allocation out of funds provided by the NIRA is $18,891,000. Of this amount we have programmed 28.67 per cent to municipalities. This will include a considerable amount of construction and reconstruction of city streets."

RHODE ISLAND, G. H. Henderson, Chief Engineer, State Board of Public Roads.—"Rhode Island's allotment under the NIRA is approximately $2,000,000. Our program as approved by the Federal authorities calls for the spending of $580,000 on extensions of the Federal aid system into cities. There are seven cities in this state and our program calls for two projects in the city of Providence and one in each of the other six cities, namely, Woonsocket, Central Falls, Pawtucket, Cranston, Warwick and Newport. Plans in each case call for the reconstruction of existing streets."

SOUTH DAKOTA, Gardner Gantz, Highway Engineer.—"A set-up of $1,500,000 has been made for improvement on Federal aid highways passing through municipalities. There are only 16 municipalities in South Dakota having more than 2,500 population. It is the endeavor of the Highway Commission to take care of, so far as possible, the larger municipalities. Next in preference come the smaller municipalities which have shown some endeavor to help themselves in the past, and thirdly, municipalities under 2,500 in population will receive some assistance."

UTAH, H. S. Kerr, Chief Engineer, State Road Commission.—"In Salt Lake City, Ogden and Provo, the three largest cities of the state, we are constructing roads through these towns which by-pass the main business districts, which will facilitate the free movement of through traffic. In the remaining towns of the state, on account of the small population and the prevailing wide streets, there are no particular problems as to traffic congestion which need attention at this time, though in connection with the NIRA program we have planned within the municipalities the improvement of existing roads to satisfactory standard."

VERMONT, George Z. Thompson, Chairman, State Board of Public Works.—"There are very few cities of any size in this state. Consequently the work being carried on within city limits amounts to a very small figure."

WASHINGTON, L. V. Murrow, Director of Highways.—"This department plans to utilize $1,990,196 of our allotment of National Recovery highway funds for the improvement of the Federal aid system through municipalities. This program includes 45 separate projects in 36 cities and towns. The work involved consists of paving, pavement widening, several grade separations, bridges, and, in a number of cases, grading and surfacing on improved alignment; also two projects that call for landscaping and beautification of slopes."

WEST VIRGINIA, Mortimer W. Smith, Chief Engineer, State Road Commission.—"Chapter 40 of the Acts of Legislature of 1933, Extraordinary Session, provides that the maintenance, reconstruction or construction of city streets forming connections for state primary roads shall be at the expense of the state and by the Road Commission. The funds made available by the Public Works program are to be expended within cities on the more important routes in reconstruction and improvement of routes forming connections for primary roads.

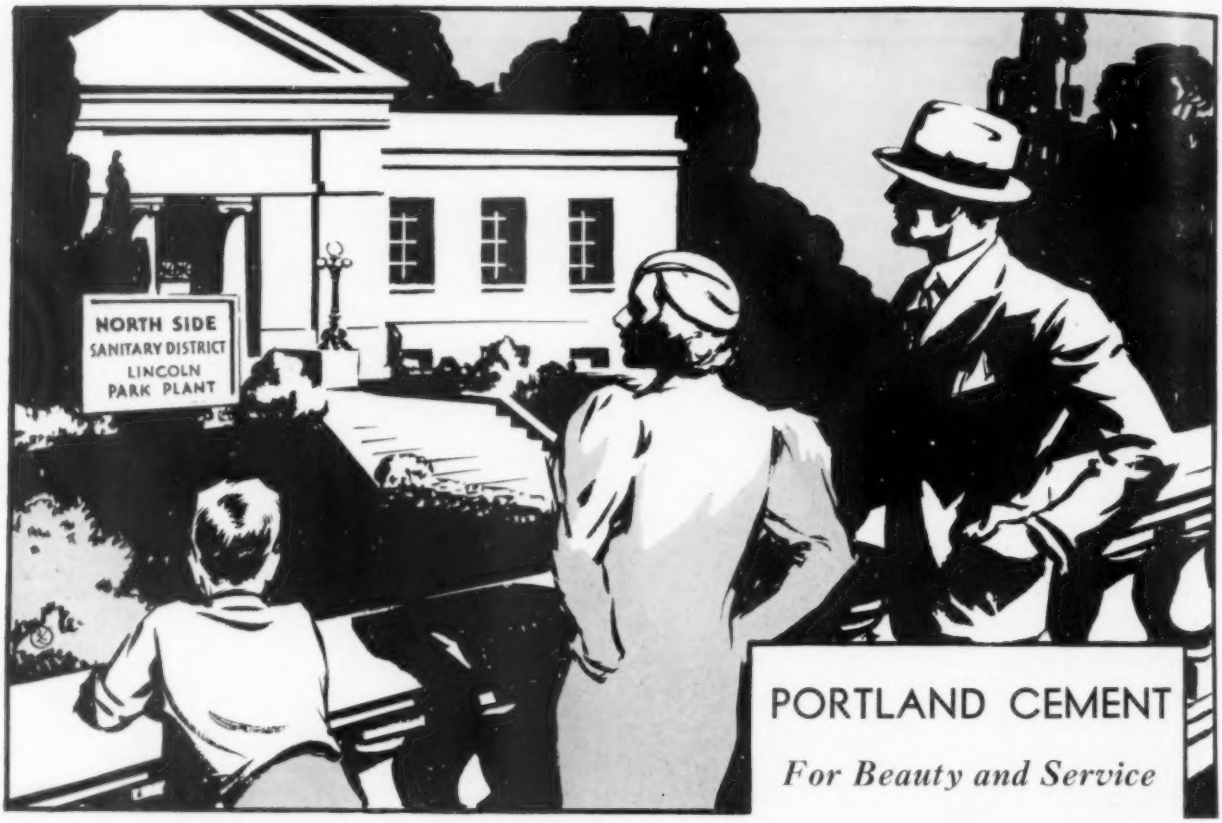
"In view of the fact that municipalities of West Virginia have for a period of four years been attempting to include the construction, reconstruction and maintenance of city streets over which through traffic flows in work to be undertaken by the Commission, the streets forming connecting parts of state routes have been permitted to deteriorate, and in rehabilitating the same an extensive program of improvements involving grade-crossing elimination, widening of narrow bridges, replacement of unsafe bridges, will be impossible."

WYOMING, James B. True, Superintendent, State Highway Department.—"Wyoming's NIRA program in municipalities consists of the expenditure of $1,125,000 in improving the surface of streets forming direct connections with the established highways. Cities in this state are so small that the problem of free flow of traffic is not present. The widening of narrow bridges is being undertaken only where it is a part of the general street improvement."

The Terms of the Act

THE National Industrial Recovery Act of 1933, under the terms of which the above-mentioned work is being undertaken in the several states, provides that funds "may be used to pay all or any part of the cost of surveys, plans and of highway and bridge construction including the elimination of hazards to highway traffic, such as the separation of grades at crossing, the reconstruction of existing railroad grade crossing structures, the relocation of highways to eliminate railroad crossings, the widening of narrow bridges and roadways, the building of footpaths, the replacement of unsafe bridges, the construction of routes to avoid congested areas, the construction of facilities to improve accessibility and the free flow of traffic, and the cost of any other construction that will provide safer traffic facilities or definitely eliminate existing hazards to pedestrian or vehicular traffic. No funds made available by this title shall be used for the acquisition of any land, right-of-way, or easement in connection with any railroad grade elimination project."

Guard Your City's Health—



A Sewage Disposal Plant Will Protect It—

Build Now with Home Labor

Cities need no longer run the risk of water-borne epidemics—streams need no longer run foul with filth.

A modern sewage disposal plant takes raw sewage—reeking with germs—and transforms it into harmless sludge and liquid. The process is simple and economical. The sludge may be converted into a useful fertilizer. The liquid is clear, clean water—purer far than the natural water of the stream.

A modern sewage disposal plant can be located anywhere. There is no odor, no unsightliness.

Engineers and City Officials: Now is the time to rouse the people to the need of this improvement.

The Federal Government is ready to help with funds. Construction will provide work for home labor without burden on home taxpayers.

A modern sewage disposal plant is not only safe and efficient, but, thanks to Portland Cement, it is an artistic addition to any community. In fact, many cities beautify their parks with these plants . . . handsome buildings of beautiful CONCRETE with the settling basins landscaped with lawns and shrubs or housed within greenhouses. When your city builds its sewage disposal plant see that Portland Cement is used for its beauty as well as its economy.

• •

For Further Information Write Room 2310

PORTLAND CEMENT ASSOCIATION
33 WEST GRAND AVENUE
CHICAGO, ILLINOIS

85 to 90% of the money spent on Concrete Construction Goes to Labor

Treatment Conserves Health

SEWERAGE and SEWAGE DISPOSAL

Checking Infiltration into a Sanitary Sewer System

FOLLOWING a reconstruction of its sewage treatment plant, the village of Lancaster, N. Y., instituted a program of sewer repair to eliminate excessive ground-water infiltration into its sanitary sewer system. The first step was to purchase sewer cleaning apparatus on approval. This was of the windlass and cable type, with a set of expanding buckets, and a patented expanding root cutter. The first sewer that was tackled, although it was a trunk sewer and 15 inches in diameter, was so clogged with roots that a wooden rod only 1½ inches square could hardly be pushed through it. Sewers known to be causing trouble were first on the program and in the 61 days that the project was carried on, 4.2 miles of sewer lines ranging from those almost completely stopped up to those temporarily clogged by obstructions were cleaned out and flushed.

The conditions found and the results obtained with the sewer cleaning apparatus were a good indication of the general condition of the sewers. Great quantities of sand and gravel were taken out of some sections, indicating trouble somewhere along the line, and a follow-up gang went to work immediately digging up and repairing the defective sewers reported by the cleaning gang. Many of the main trunk sewers had been laid through undeveloped land, which was crisscrossed by brooks and drainage ditches and here the greatest amount of trouble was found. Wash-outs and cave-ins were numerous, most of them being found along undeveloped "paper" streets where Y connections to building lots had been provided with a sheet iron cover which had rusted away, and those which had been provided with a terra-cotta cover leaked because the cover had not been cemented into place. Practically all the tile joints were found to have no calking whatsoever, those which were calked being closed on the top of the joint only. Recalking was done with a cement mortar by digging a bell-hole at each joint, scraping the joint, packing it with oakum and then calking it with cement. Use of a poured asphalt joint was out of the question, for every joint leaked and, judging by the condition of the soil around it, had leaked for a long time. A pre-molded asphalt joint could have been used but since this type of joint was not considered as impervious to roots as the cement joint, the latter type was decided upon.

Several manholes in undeveloped areas were found to be serving as storm-water receivers, owing to the settling of the original sewer trench below the surface of the surrounding land, which resulted in a natural watercourse along the top of the trench to the manhole, where in some cases bricks had been removed and in others the action of the frost had loosened the bricks, which had later fallen into the manhole.

Much infiltration of surface water was prevented by cleaning and widening, and in some cases relocating, brooks and drainage ditches which were in close proximity to the sewer lines. Although the sewer reconstruction project lasted but 61 days, having been discontinued owing to lack of finances, beneficial effects of the work were noted immediately. At the disposal plant, one centrifugal pump, rated at about 400 gpm, now handles the entire normal sewage flow, which formerly overtaxed two pumps of the same capacity, and a marked saving in power cost has been effected.

—From a paper on the remodeling of the Lancaster, N. Y., sewage treatment works and sanitary sewer system, by HAROLD J. HUBER, Superintendent of Public Works, Lancaster, N. Y., presented before the New York State Sewage Works Association.

Control of Odors

IN order to control the odors arising from sewage treatment plants, disinfection plays a major part. The bacteria which reduce the larger molecules should be destroyed in part before the sewage enters the plant. The least expensive, as well as the most effective, chemical for this purpose appears to be chlorine, or a compound containing available chlorine. Introducing the chlorine at a point upstream from the plant should eliminate odors caused by active bacteria. Chlorine will likewise combine with certain compounds such as hydrogen sulphide, and the result of this reaction will be an inoffensive compound.

The sewage operator's duties are not fully performed by disinfection alone. Cleanliness in every step of disposal is most important. The screenings from the rough rack and fine screens should be disposed of in a suitable manner. Incineration is the most complete method of disposal of screenings. The one drawback to incineration is the heavy percentage of moisture in the screenings. Through the addition of combustible waste, such as waste paper, screenings can be burned.

Another method of disposal is burial in a trench. This is suitable for small plants but too expensive for larger plants. If it becomes necessary to place screenings or scum in a pile, for any period of time, it is advisable to disinfect the mass to inhibit putrefaction. Bleaching powder is suitable for this purpose. A third method of disposal is the separate digestion of the screenings and scum. This has been done with marked success in Washington.

A liberal application of water by means of a hose is a great help in keeping the sides of channels and tanks free from grease and organic matter. The methods by which odor may be controlled are not expensive, although they involve a certain amount of work and some expense. The methods employed must be practical. The operator must keep in mind that the city or village officials desire the plant to be kept clean, to function properly and to be free from odor. The taxpayer requires that the cost of operation be kept as low as possible.

The embellishment of the plant grounds is a means of odor control. Through proper selection of trees and shrubs, such as pine, spruce, white cedar, larch, honeysuckle, etc., the plant grounds can be made so attractive that much of the odor from the plant will be masked. There is a small sewage plant near a village west of Rochester which has been in operation for twenty years. The tanks are shallow, and troublesome wastes discharge into them. There is an offensive odor present at all times, but the grounds are so well embellished with shrubs, pines, and nut-bearing hardwood trees that the people passing by on the highway scarcely notice the odor. While embellishment is not closely associated with odor control, there is an important connection. Instead of planting only coniferous trees around the plant grounds, it might be better to include more berry-bearing shrubs of the honeysuckle type and some nut trees. In this way, the song birds and squirrels are attracted to the plant grounds because they have a food supply not found on the conifers.

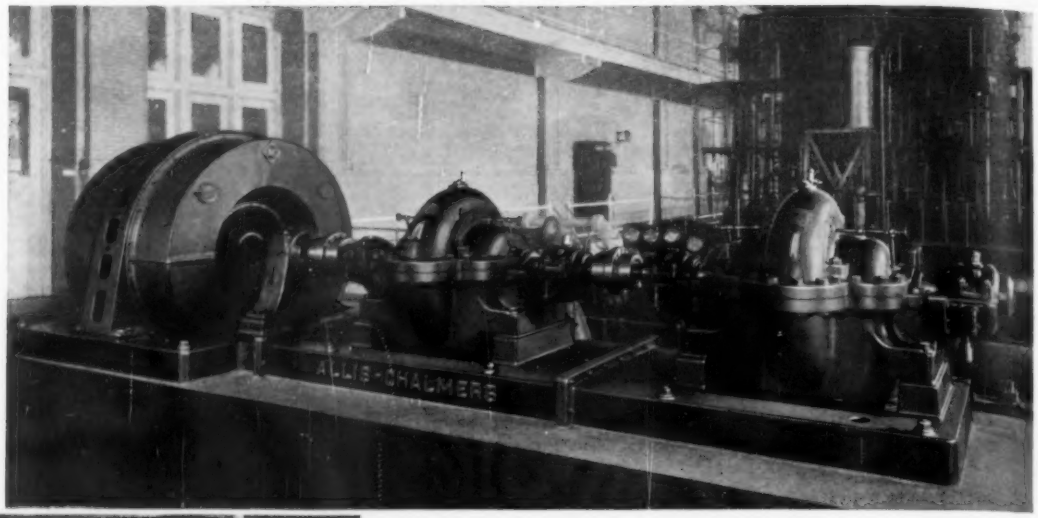
Collecting and burning the gas from the slots is a great aid in odor control. There is likewise a fire hazard wherever gas is present. It is necessary either to prohibit or to discourage smoking around the plant where gas is collected.

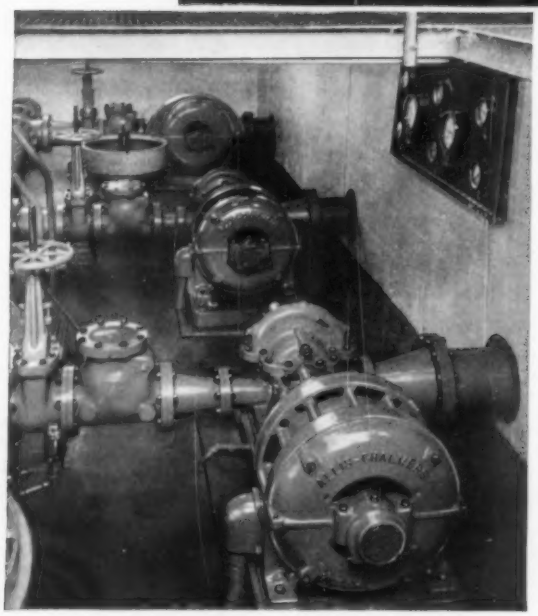
Glass covers over the sludge beds will confine the odor. Well-digested sludge should not give off any offensive odors. Glass covers over the tanks have met with favor in some communities.

—From a paper presented by WM. A. RYAN, Sanitary Chemist, Rochester, N. Y., before the Sixth Annual Conference of the Pennsylvania Sewage Works Conference.

Noteworthy Articles in the July, August, and September issues of The American City:

Equitable Adjustment of Charges for Treating Trade Wastes; Renovating an Institutional Sewage Disposal Plant; Financing Sewerage Works; From Disposal by Dilution to Separate Sludge Digestion.





ABOVE — Allis-Chalmers 20 mgd 310 ft head pumping unit with 1250 hp Allis-Chalmers Synchronous Motor recently furnished to District of Columbia as the first unit in electrifying an old steam plant. The performance of this unit earned a bonus on acceptance test.

BELOW — Allis-Chalmers Centrifugal Pumps and Motors in the Pumping Station of the City of Wauwatosa, Wisconsin, which effected a material saving in the cost of pumping.

Modernize ... with Good Pumps they pay for themselves

THE large quantity of water which can be delivered by the relatively small centrifugal type of pumping units together with recent improvements in details of design materially lowering the power required for the drive and correspondingly reducing the cost for current, present interesting possibilities in pumping plant rehabilitation or when increased capacity is needed. Where equipment is to be paid for out of earnings, only high grade pumps can be considered and those which have sustained high economy and low maintenance. Allis-Chalmers Combined Centrifugal Pumping Units have long been recognized as having these qualities.

Write for Bulletin 1650.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

Collection and Disposal

Garbage, Ashes and Rubbish

Bremerton, Wash.

THE Municipal Garbage Department of Bremerton, population 10,170, uses three trucks in making collections —one 1930 Ford, one 1930 Studebaker, and one Chevrolet. There is a spare Chevrolet truck which is used in case other equipment is tied up for repairs. All trucks are 1½ tons capacity, with special bodies capable of holding approximately 4 cubic yards. Each truck makes an average of six trips daily. All refuse is disposed of in the sanitary fill and completely covered daily. The daily collections of garbage are completed by the afternoon, and with the aid of a Caterpillar Fifteen tractor, the trucks are loaded with material for covering the garbage by means of a trap loader. Approximately 25 cubic yards of earth is used daily for covering.

This method of disposing of garbage has been in use for the past ten years and has proved satisfactory. The filling-in of undesirable property has been a great improvement to the city. A playfield of about three acres has been built over a fill that required several years to make. It was orginally an unsanitary lake in the heart of the city. About two acres have been added to the city park by filling in tide lands. It is expected ultimately to reclaim about four acres and build a seawall around the enclosure. Several other pieces of undesirable property have been filled and made into attractive locations. One place required a maximum of 26 feet of fill. The city is now engaged in filling property which had to be taken over for taxes, and is securing the material for cover from a street nearby, so that the fill will be completed and the street graded at the same time.—C. C. CASAD, Superintendent of Streets.

Controlled Tipping

CONTROLLED tipping is a new form of sanitary fill, used in England, in which refuse is not dumped helter-skelter along a wide front, but is tipped or dumped in lanes or terraces about 24 feet wide and 4 to 6 feet deep. Very careful consideration is given to the arrangement of the terraces and to provision for roadways entering the dumps and leading from one terrace to another. The angle of the slope of the terrace should be on the ratio of about 1 foot 2 inches at the base for every foot of vertical height. The use of these narrow and very thin terraces reduces to a minimum danger from fires, the amount of surface to cover at the end of a day's work, uneven settling, invasion by rats, and annoyance caused by paper blowing about. The terraces are built in straight lines or curves with all the appearance of formal landscaping. The surface is sodded, sown with grass or banked with shrubbery every day. A slight elevation about 2 feet 2 inches higher at the outside edge is made along the terraces as a preventive of scouring from rain.

Refuse is not dumped at the face of the terrace in a careless manner. All tin cans are raked to the bottom, placed upright and packed with earth. This prevents hollow places and is a good protection against rats. Carpets and other bulky articles are laid at the bottom and pounded flat. Cardboard boxes, crates and bottles are all broken. Ashes and cinders are kept near the surface. The main object is to back the refuse solidly so that when organic decomposition sets in, there will be a minimum of shrinkage on the surface. In English cities where the amount of ashes is in low proportion, the shrinkage in the level of the terrace does not exceed 1 foot in six. By controlled tipping English cities are salvaging an immense amount of land for recreation and other profitable purposes without the slightest nuisance or inconvenience. In Bradford, where controlled tipping is at its best, residents all over the city continually request that the cleaning superintendent raise the level of their garden plots or an adjacent vacant field, or make a park out of a boggy ravine. A stone quarry was filled up through this process in such a way that nine-tenths of the inside of the quarry was in green grass like a verdant amphitheater at any one moment during the work.

—From a report by J. C. DAWES, Inspector of Cleansing, Ministry of Health, England.

Collection Methods in England

WITH their eyes on costs, the officials in charge of refuse collection in England have experimented with different types of vehicles. High-loading and unsanitary trucks have been discarded and in their place cities employ low-loading, dustless vehicles. They are in distinct contrast with the older type of equipment used so prevalently in the United States, where until the past year or two little improvement has been made. Different methods are employed to obtain the low-loading and dustless features and any number of them are working satisfactorily. A height of 4 feet 9 inches is considered the most effective loading line.

Although most of these vehicles are dumped from the rear, in some cases the body is tipped from the side by an overhead hoist at the disposal plant, and in some instances sections of the body are lifted by crane and dropped directly onto the charging floor. Some of the vehicles hold as much as 15 to 20 cubic yards of refuse. Electrically driven vehicles are very common and have proved exceedingly economical. They are applicable only in large cities without grade, where the length of haul is not over 5 miles. The batteries are recharged at night, usually through power generated by burning refuse. Glasgow and Birmingham are two examples of cities using electric equipment. The cost of operating electrically driven vehicles is about half the cost of operating gasoline-engine-driven equipment, because of the cost of gasoline in England. The cost per hour for a 15-cubic-yard electric truck in Glasgow, including driver, is $1.08.

Another feature of British refuse collection is the standardization of dust-bins or containers. Unsightly ash-pits, boxes, barrels, and other crude containers are almost a thing of the past. In their place, uniform galvanized iron dust-bins or barrels are employed. The common sizes are 1½ cubic feet and 2½ cubic feet. These are frequently purchased in large quantities by the city and sold or rented to the householder. In other cases, standard specifications are established and the householder may purchase his own containers. The former practice has proved cheaper and more satisfactory. Even the dust-bins have been subject to study leading to the invention of special features of design and type of lid. Some of these bins fasten onto sliding openings in the collection vehicle and are automatically discharged into the vehicle without any dust nuisance whatever. An interesting device employed by certain vehicles which can be loaded from both sides is the hanging of rubber strips from the enclosed roof of the vehicle, which permits the receptacle to be emptied easily but prevents a draft of wind from blowing dust out of the vehicle.

There is no attempted uniformity in the frequency of collection. Some cities claim that daily collections are essential, and the public that has once had daily collection would not be satisfied with less frequent service. Three collections weekly are very common, and two collections perhaps most common.

In some cities the refuse is collected in the early hours of the morning and with but one trip. In Edinburgh, for example, the vehicles go out at six, and the complete job is done at nine. This can hardly be called economy in man-power and equipment, for although the equipment is used for other work during the remaining portions of the day and the men are employed on street cleaning and other work, their most economical use is impossible.

—From "Some Observations on Municipal Practices in European Cities," by Donald C. Stone, published by The International City Managers' Association.

"SPRINKLER WATCHMAN paid for Itself First Time It Called Fire Department" —Says Schenectady Hardware Merchant

EVERETT ZEH
SUPT. FIRE & POLICE TELEGRAPH

DEPARTMENT OF PUBLIC SAFETY
CITY OF SCHENECTADY
OFFICE OF THE
SUPT OF FIRE AND POLICE TELEGRAPH

July 5th, 1933.

The Gamewell Company

Newton, Mass.

Gentlemen:

I am pleased to state that we had quite a unique experience here in Schenectady with one of the Sprinkler Watchman installations. Sunday morning during the Christmas Holidays, a call came in from the Clark Witbeck Co., wholesale hardware dealers. The master box, connected to the Central Office was tripped by leaky piping. The fire department arrived in time to force an entrance and shut off the water supply before much damage had been done, there being but two inches of water on the basement floor. Think of what might have resulted had our department not been called! Mr. Witbeck expressed himself as highly pleased, and said that it had paid for itself with that one experience. Incidently, the Underwriters told Mr. Witbeck that it would not be necessary to hire a watchman if this installation was made. It did not take much of an argument to sell him the idea.

At another location, a large wholesale grocery house, the architects insisted on this type of installation.

Very truly yours,

EVERETT ZEH.
Supt. Fire & Police Telegraph.

EVERETT ZEH, who has charge of the municipal fire alarm system at Schenectady, N. Y., sent us this latest story of the Gamewell SPRINKLER WATCHMAN'S efficiency. What better evidence could anyone want on the value of connecting automatic sprinkler systems with the municipal fire department through a Gamewell master type fire alarm box!

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS
"A Box A Block"

Fire–Police–Safety

Items for Departments of Public Safety

To Raise the Standards of the Fire-Fighting Profession

"I HAVE tremendous respect for the average fire chief," said John B. Blandford, Jr.,* before the National Fire Protection Association, "but occasionally a picture emerges which is not encouraging. I see a fire chief whose personnel policy is disrupted by politics, who must buy equipment on the basis of conflicting testimony of salesmen, who must rely for his standards and methods on the National Board of Fire Underwriters, who cannot run a fire prevention campaign without the guidance of a chamber of commerce committee, who must call in the paint merchants to finance his clean-up week, who has no information as to losses other than that furnished by the local insurance representatives, and who sees his appropriation whittled down at the insistence of a group of taxpayers which strangely enough includes representatives of those interests who had previously told him he needed more equipment and more man-power.

"Perhaps this fire chief is an exception. Certainly, I do not wish to minimize the significant contribution that is being made by important cooperating agencies. However, I do think it is interesting to speculate as to whether this particular chief could stand alone were the many props and helping hands withdrawn. Conceivably, there might be those who would consider it a wise policy to make a fire chief dependent on outside resources and therefore easily susceptible to guidance. I think it would be a wiser policy to make him more self-reliant, to open wide the doors of information to him, to stimulate his professional pride. In that way, we create a new intellectual force in the field and do so at a point of maximum effectiveness. We should hasten the day when the fire chief can confer, speak and act authoritatively on all phases of fire protection. This is to the interest of those who pay taxes and those who pay insurance premiums."

Partisan Interference with Police Efficiency

MUNICIPAL officials who would be ashamed to drive a ten-year-old automobile are guilty too often of the much more serious offense of determining public policy on the basis of century-old, discredited methods of partisan politics. A recent instance is told in *Just a Moment*, the weekly bulletin of the Buffalo Municipal Research Bureau:

Police Teletypes

In the June 8th issue we announced the substitution of Teletypes for the old Morse instruments for sending out police messages. We were premature and too optimistic.

For the substitution it was necessary to spend $1,500, or rather to transfer that amount from another fund, to rent the machines.

We quote from the newspapers what happened:

"After Councilman Thomas J. O'Donnell objected to the transfer of $1,500 for installation of two-way Teletype machines in the police stations because of a fear that it would result in the ousting of desk lieutenants, the proposal was referred to the finance committee by a straight party vote of eight Democrats to seven Republicans. The latter contended that the new system would increase the efficiency of the police department."

On June 27th on the recommendation of the Finance Committee the request for the $1,500 was "received and filed," and thereby refused.

Highway Department Suggests Ordinances for Street Safety

REGULATION of "stop and go" signals, parking, repairing and maintenance of gasoline pumps on streets in the Indiana cities where improvements are to be made by the Indiana State Highway Commission with Federal funds, is provided in ordinances sent to the mayors and councils of these cities by James D. Adams, Chairman.

With the copy of the ordinance, which must be passed to assure final approval by the U. S. Bureau of Public Roads, is being sent a letter of instructions from the Highway Commission. It is suggested that in each of the cities where an improvement has been tentatively approved, the city officials should act at once to see that all public utility pipes, lines and conduits in streets to be improved are placed in good condition.

This action should be taken at once in order that the improvement may not be delayed when the contract is awarded and the work is started. It is also suggested that on streets to be improved, the city officials act to have any street, interurban and steam railroad tracks placed in good condition.

If the tracks are put on a good foundation with good ties and the rails properly aligned, the Highway Commission will be permitted to improve the street over and between the ties to the top of the rails. If the track is not put in good condition, the improvement can be made only to the end of the ties.

The ordinance sent to city officials for passage as a preliminary step to final approval of the improvement of streets with Federal funds, forms an agreement on the part of the city to maintain with its own funds after construction any streets improved under this plan.

The proposed ordinance also contains sections which give to the State Highway Commission the right to determine whether or not "stop and go" signals shall be maintained and operated on any street improved with Federal funds. It binds the city to place and maintain signals on such streets at the request of the Commission, and forbids the placing or maintenance of such signals on these streets without the consent and approval of the Commission. The Commission is also given the power to determine the type of signal which may be used.

Other sections of the ordinance limit the parking on a street improved with Federal funds, to one side of the street when the street is less than 36 feet in width from curb to curb. Diagonal parking on streets less than 40 feet from curb to curb is also prohibited. The placing or maintenance of gasoline or other pumps in the sidewalks of such improved street where it is less than 36 feet from curb to curb is forbidden.

Still other sections forbid cutting into the pavement without the permission of the city, and then only under its inspection; the building of fires and other practices which would damage the street surface and the piling of materials or other obstructions on such streets.

New Radio Distribution System for Sing Sing

ARRANGEMENTS for the installation of a modern multiple radio receiving system which will distribute three separate programs simultaneously to every cell in the state penal institution, have been made by Warden Lewis E. Lawes of Sing Sing.

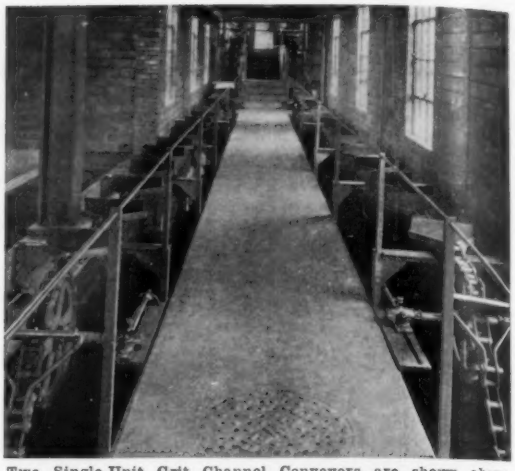
The equipment is being supplied by the RCA Victor Company, Inc., with funds raised from the proceeds of prison athletic activities. The programs will originate from three control panels having separate radio receivers feeding into a centralized sound distribution system, and sent out to the individual earphone sets located in the cells. An automatic phonograph mechanism is also being provided so that programs of recorded music may be sent over the same system. Two new "velocity" type microphones will be located in the chapel-auditorium and on the athletic field so that religious services, lectures and announcements can be carried through the entire institution.

The Mutual Welfare League of Sing Sing provided the funds.

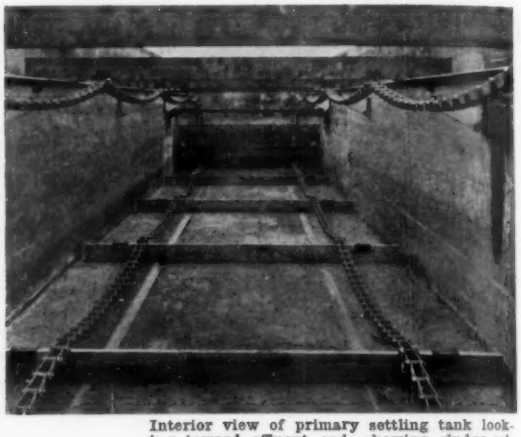
* Announcement has just been made (September 27, 1933) of Mr. Blandford's resignation as Director of Safety of the city of Cincinnati, to accept appointment as assistant to Arthur E. Morgan, Chairman of the Tennessee Valley Authority.

Pat. Pending

An improved Self-cleaning Bar Screen which insures an efficient and thorough screening of sewage. Completely automatic in operation.



Two Single-Unit Grit Channel Conveyors are shown above. This is the most efficient method of grit removal.



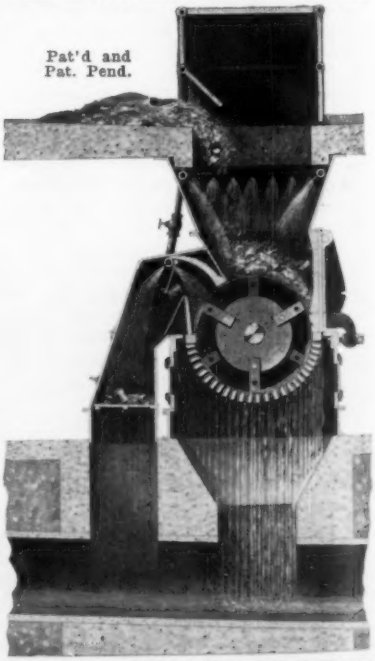
Interior view of primary settling tank looking toward effluent end, showing sludge-collecting flights on tank bottom and returning flights on upper runway acting as skimmers.

Cut Sewage Disposal Costs with . . . . Proved Equipments

To operate your plant efficiently and at low cost it is important that you select the right kind of equipment.

From the diversified line of equipment for Sewage, Garbage and Refuse Disposal Plants, and Light and Power Plants, Jeffrey Engineers can and will help you select the right unit to do your job efficiently and economically.

Some of the proved equipments offered by Jeffrey to lighten the burden and to speed up sewage and garbage treatment processes are shown here. These and others are completely described in our New Bulletin No. 545-C. Send for it today.



Pat'd and Pat. Pend.

Cross-section view of New Jeffrey Sewage Screenings and Green Garbage Grinder. An entirely new process to easily and inexpensively dispose of screenings and garbage by grinding, after which it is discharged into the sewerage system.

The Jeffrey Manufacturing Company

970-99 North Fourth St., Columbus, Ohio

New York	Pittsburgh	Detroit	Denver
Buffalo	Boston	Chicago	Huntington, W. Va.
Rochester	Scranton	Milwaukee	Birmingham
Philadelphia	Cincinnati	St. Louis	Dallas
			Salt Lake City

Jeffrey Manufacturing Company, Ltd., of Canada

Head Office and Works: Montreal

Branch Offices: Toronto, Calgary, Vancouver

OCTOBER, 1933

Vol. XLVIII, No. 10

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

The Crisis in the Property Tax

Is the British System the Answer?

By ERNEST S. GRIFFITH
Professor of Political Science,
School of Citizenship and Public Affairs,
Syracuse University

PERIODICALLY in our more recent municipal history suggestions have been advanced for fairly fundamental modifications of the local property tax. Of late, these have become more insistent, as city after city sees the pyramiding of delinquent taxes and tax sales in the face of an already glutted real estate market. Among the many proposals for reform, naive and serious, one often hears that the English system of local rating offers a worthy substitute. Moreover, it is urged that this system—which assesses the tenant on the basis of his rent—thereby also offers much less opportunity for the favoritism and inequality in assessments still characterizing perhaps the majority of our great cities.

It is perfectly true that these conditions constitute one of the chief menaces to sound municipal administration. The practice of systematic under-assessment of the favored few—whether individuals or corporations—apparently is not the least among the weapons in the armory of many of our political machines. The opportunity for this is enhanced enormously by the general practice of under-assessing all property in order to avoid protests. Reductions and advances can thus be used with comparative immunity as records and punishments for political activity. Where such under-assessment is characteristic of business property, fear of jumped assessments becomes one of the many reasons why so few business men appear as active municipal reformers. They dare not take the risk in a competitive society.

Large numbers of property owners have been caught in a jam between declining rents, mortgage payments and taxes. In many instances, so much have rents fallen that frequently they do not even suffice for interest and taxes, and the property is forced into foreclosure; or, if occupied by the owner, into tax sale. High taxes are also among the alleged causes of the depreciation in the money value of property, and make the investor wary of real estate. This state of affairs is admittedly unsatisfactory, but does one need to throw over the whole system to find a remedy?

Little or Nothing to Justify Imitation

It becomes important to examine the suggested alternative of the British system. Perhaps the tradition that their cities are well-governed leads one to expect too much of British methods in raising local revenue; for certainly a closer examination shows that there is little or nothing that would justify imitation of this particular aspect.

British cities assess the tenant and not the owner of property, and compute the local tax at a certain percentage of the rent paid—e.g., 9 shillings per pound. If an owner occupies his own property, a rent is assumed and he is charged accordingly. In houses of low rentals rates are collected with the rent by the landlord and paid to the city minus a large discount for collection. Unoccupied land and houses pay no taxes. Even though this particular aspect might conceivably be somewhat modified, to base a tax system on use and occupancy rather than on ownership becomes neither more nor less than a tax on room space. In other words, there arises therefrom a sharp penalty upon development of property. The higher the tax rate, the greater the penalty, and thus the more the tax system becomes responsible for checking the increase in national wealth. Furthermore, this fact is largely responsible for the considerably greater overcrowding per room in an English city than here.

On the other hand, in so far as ownership rather than occupancy is taxed—particularly in the case of land—there is in the United States a continuous pressure to develop one's property, or to sell to some one who will. Thus our tax, in so far as it is on land, stimulates capital investment and, in so far as it is on real estate generally, increases its use. A by-product is found in a distribution of home ownership much more widespread than in England, through the fact that our tax on land results in a constant stimulus to change of owner. Furthermore, there would appear to be some evidence that a plan of assessment of land at a higher rate than improvements (as in Pittsburgh) results in even more favorable development.

How far this American plan of stimulation of increase of wealth by penalizing its non-use, as compared with the British plan of checking the creation of wealth by taxing its use, has developed in the respective countries may be seen in the fact that the per capita value of improvements in the average American city is approximately three times that in the British city. While other important factors enter in, the tendency seems unmistakable.

Furthermore, as a producer of revenue there is no comparison. An American city is able to raise double or

treble the amount locally raised under comparable circumstances in England.

Is Subsidy a Cure for Faulty Taxation?

These factors have forced the British city to do two things which have to any comparable extent been spared the American city. In the first place, except in the luxury class, house-building in Great Britain would virtually have ceased, had not the Government undertaken itself to build houses for its people through subsidy or actual construction. In the second place, the extreme burden resulting from these rates has forced central subsidy in increasing measure for functions such as education, police, health, etc., so that these central grants comprise from one-quarter to one-third of local revenue for all purposes.

While one may visualize a point beyond which our tax on real estate ought not to go, and even admit that perhaps the point has already been reached in some of our cities, it would still appear to be at a much higher productive level than under the British system. In so far as the latter has evolved more efficient and impartial assessment, the fault with us lies much more in our machine-ridden local governments than in a particular type of taxation. Sound assessment procedures are available, though our will to use them may be lacking.

Current tax sales and delinquencies would appear to be the result, not so much of the taxation system, as of the deflation and depression of the past three years. With stationary or rising price levels and business recovery, we may look for this aspect largely to pass out of the picture. House-building will then resume its normal course, and except for slum clearance, may be left to private enterprise. Certainly a change to the British system of taxing offers no way out of this or other housing problems. If an alternative should be needed—and this may be possible even under recovery—it will be found elsewhere than in British experience.

EDITORIAL NOTE.—A much fuller discussion of the subject is found in the author's "Modern Development of City Government," Vol. II, Chap. X.

The British System of Local Taxation

Some Reactions to Professor Griffith's Criticisms

By **THOMAS ADAMS**

THE difficulties involved in changing the system of taxation in the United States to correspond with the British system would be almost insurmountable; and if the change were made, it is very doubtful if it would be to the advantage of American cities. At the same time, the valuation of landed property in America for all purposes, including its assessed value for taxation, should be based on income value. This is fundamentally important, whatever the system of taxation.

With regard to the British system as it works in Britain, I think Professor Griffith is not quite correct in some of his statements and assumptions. I venture to submit the following comments:

(1) It is not quite correct to say that "a rent is assumed" in the case of property occupied by an owner. The rent is carefully computed by trained valuers on the basis of what it would bring in the market. It should be noted at this point that all valuation in England is undertaken by men who are thoroughly trained in principles and practice of valuation.

(2) The statement that unoccupied land and houses pay no taxes is too sweeping. Property has to be *completely* unoccupied and unused before it is exempt. As, however, the British system is based on taxing income, it may be generally accepted that where there is no income derived, the property is exempt from taxation. This is one of the reasons why taxes are always collectible and never confiscatory.

(3) It is not quite the case that the British system is based on use and occupancy rather than on ownership. Use and occupancy are incidents in creating income from the property, but in the final analysis the tax is paid by owners.

(4) I do not agree that the British system is a penalty upon the development of property. Naturally, if it cannot produce income without being developed, the theory may be advanced that the tax is a charge upon the development. In practice, however, the fact that a man does not pay taxes on potential as distinguished from existing values of property means that, on the whole, developed property pays less in local taxes in British than in American cities.

The greatest factor in stimulating development, and therefore the increase of national wealth, is security of investment. Given this security, I do not think that wealth suffers much, if any, diminution by reason of the system of taxation. Under the British system there appears to be the maximum of security for investment in property.

(5) The system of taxation has no connection with overcrowding of rooms. On the other hand, it has greatly encouraged the lower density of building which has resulted in preventing the worse conditions which result from overcrowding of buildings on the land.

(6) I agree that there is more pressure to develop urban land in the United States than in England. But this pressure, so far as it is forced by taxation, has resulted in evils rather than benefits. In Britain there is no limit to the amount of land that is available for building to meet all public wants, yet people are not forced by the pressure of taxation to throw their land onto the market before it is actually needed; therefore, building spreads evenly in the suburbs and cities, and suburban land is maintained in cultivation until it is actually needed for building.

A tax on capital values stimulates capital investment in land speculation. In my view, however, this is an evil; land should be developed for use and not to provide profits out of speculation.

(7) In recent years home ownership has grown very rapidly in England, while tenancy appears to be increasing in large cities of the United States. In the last ten years the building societies in England—which lend money to home owners—have increased their capital which is used for loans to an enormous extent.* This has occurred in spite of vast expenditures by the Government on the erection of houses.

(8) The creation of wealth is not checked by taxing the proper use of land, if the tax fund is used to create public

---

* The total amount of advances on mortgages by Building Societies in England has increased from £15,840,961 in 1919 to £82,142,116 in 1932; while the total assets of the same societies have increased from £77,346,603 in 1919 to £469,334,048 in 1932. Most of the money advanced by Building Societies is a loan on houses of a value of less than £1,000. These figures should be multiplied by 4.7 to convert them into dollars.

wealth. The British system encourages the use of land for building only when it is "ripe" for building, and for agriculture when it is suitable only for agriculture. The fact that the per capita value of improvements in the American city is so much greater than in the British city is surely due to the difference in money values and has nothing to do with any question of taxation.

(9) There is no doubt that the American system is a better producer of revenue. Local taxes in the American cities are much higher than in the English cities. This indicates that they do absorb more private wealth for public uses and is one of the reasons why taxes are difficult to collect.

The facts mentioned by Professor Griffith have nothing to do with the house-building in Britain by the Government. A large proportion of the population in all countries cannot afford to pay an economic rent for a satisfactory home. American figures show about one-third of the population earning less than sufficient to purchase new houses. The question of building houses by Government for small wage earners is not being solved by private enterprise in any country, and exists with widely different systems of taxation. The high rates of taxation in Britain are largely due to the fact that the Government has built houses for this class and is maintaining an expensive system of insurance and unemployment relief. These are the main reasons why so much of the taxation has to be borne by the National Government.

A Rejoinder by Professor Griffith

IT is difficult in a brief rejoinder to enter into the complicated question of the incidence of the British and American local taxes, but the reader will perhaps be aided in forming his opinion by a consideration of the "marginal" unit of potential building land. In the United States this pays taxes, and hence there is pressure to build. The fact that approximately half the tax is on the land after the house is built and that this has largely been discounted in the sale price of the land, lessens the "drag" upon house-building arising from the fear of taxes. The same unit of land in England—paying, as it does, little or no local tax—would not be built upon until the tenant is willing to pay the entire tax, on the land as well as the house.

I do not think that Dr. Adams will find many economists who would agree with his statement that the entire tax in England falls on the owner. In so far as there is any element of truth in this, surely it is only because the landowner, if under no pressure to sell, might (were it not for the local rate or tax) possibly extort a still higher price for his land—a practice akin to monopoly. My contention is, therefore, that the point at which land is "ripe" for building (to use Dr. Adams' expression) occurs at a considerably later stage in England than in the United States—meanwhile producing no municipal revenue; and if this be true, then my theses that relatively the British tax (a) constitutes a drag on the creation of taxable wealth, (b) forces the overcrowding of existing houses, and (c) forces the Government into a policy of subsidizing house-building, are accordingly demonstrated. The higher the rate of the tax to be imposed subsequent to building, the greater the delay in building.

I agree that the American plan results in greater crowding of land (not of rooms) in the center of cities; but to say that building "spreads evenly" in the British suburbs is merely a euphemism for the row on row of cheerless uniform houses that characterized British cities until the Government began its expensive subsidy and town planning program. And land overcrowding in American cities can be, and should be, controlled by zoning ordinances under which the community and not the landowner will determine the maximum density of use compatible with the public interest.

Surely the figures of home loans of building societies are somewhat deceptive. The year 1919 marked the end of the five-year period during which all building ceased. Most of the growth since then has been the result of government subsidy. It is doubtful how far it would have taken place otherwise.

Points (1) and (2) as made by Dr. Adams, I am aware of. I should have chosen my language a bit better in the interest of clarity. Local rates in England are "always collectible" only because the municipalities pay the rents *plus rates* (!) of the poorest tenants to save them from eviction—and then collect the rates from the landlords.

To tax income penalizes development; to tax ownership stimulates use. This is the heart of the analysis, and applies not only to vacant land and houses, but to relatively obsolete property as well.

Broadcasts to Discuss Municipal Finance

EACH Tuesday evening at 7:15 Eastern Standard Time from October 3, 1933, to February 6, 1934, the National Broadcasting Company will carry on its nation-wide network discussions by outstanding speakers on various phases of "The Crisis in Municipal Finance." These broadcasts are a continuation of the "You and Your Government" series which has had such favorable reception this year and last. The programs are sponsored by the Committee on Civic Education by Radio of the National Advisory Council on Radio in Education and the American Political Science Association. The Committee on Citizens' Councils for Constructive Economy of the National Municipal League is cooperating in their presentation. The broadcasts will, as heretofore, be non-partisan and impartial in their presentation of timely information on governmental affairs. They are widely used as discussion topics in clubs and civic groups and in the schools and colleges as supplementary instruction in classes in government.

The program for the October broadcasts follows:

OCTOBER 3.—THE FINANCIAL PLIGHT OF THE CITIES
Hon. Murray Seasongood, President, National Municipal League; former Mayor of Cincinnati, Ohio
C. A. Dykstra, City Manager, Cincinnati; President, International City Managers' Association

OCTOBER 10.—SECRETS OF MUNICIPAL CREDIT
Morris Tremaine, Comptroller, New York State
Frank H. Morse, Lehman Brothers, New York
Howard P. Jones, Secretary, National Municipal League

OCTOBER 17.—NATIONAL CREDIT FOR LOCAL NEEDS
Henry T. Hunt, General Counsel, Federal Emergency Public Works Administration
Prof. Charles E. Merriam, University of Chicago

OCTOBER 24.—DEFAULT AND ITS CONSEQUENCES
Newton C. Farr, Chairman, Chicago Recovery Administration
Henry P. Chandler, Attorney, President Union League Club, Chicago
Dr. A. M. Hillhouse, Northwestern University

OCTOBER 31.—DEFAULT AND ITS REMEDIES
Mayor James M. Curley, Boston
David M. Wood, Attorney, Thompson, Wood & Hoffman

Citizens to the Rescue

By EDWARD M. BARROWS

MOST of us have encountered the queer paradox of the public institution. It must watch eternally to keep itself from spreading the social evils it is created to check. Jails must not create criminals. Hospitals must not spread disease. Labor unions must not discredit labor. Liquor control must not foster intemperance.

The difficulty of democratic government is to keep itself from discouraging democracy. City government is a complex matter, full of technicalities that require expert handling. Sincere public officials know this, and in times of trouble have preferred to turn for help to the brethren of their craft rather than to the taxpayers who elected them. We see this tendency at work in the scores of organizations of public officials, each society dealing with the specialized phase of government that its own members encounter. Then we see the backfire inevitable if dependence is placed on such mechanisms alone. The average citizen may wish to take a hand in government, but the main channels of interest ordinarily open to him are political elections and taxes. The result, too often, has been that many of the more intelligent citizens have lost interest in government, while the mass of emotional voters have turned to the wily and willing politician to wield their influence for them.

This has been a natural sequence for which no one in particular is to blame, and in which there has seemed to be no way out. But Depression, like Providence, moves in mysterious ways its wonders to perform, and along with accomplishments too disheartening to mention, it is performing the remarkable feat of bringing the intelligent citizen into contact with his government again.

The tax crisis, strangely enough, is bringing about this reconciliation. Town and city governments are as technically involved as ever, but the taxing power remains with the people, and the combined governmental brains of the country in expert conclave are powerless in the face of a tax strike. On the other hand, taxpayers are learning the bitter lesson that public economy based on anything but understanding of how and why taxes are expended is only making bad matters worse. The sooner and more directly the wealth of business experience, scientific knowledge, financial ability, and administrative capacity to be found among the citizens of any moderate-sized community can be put in touch with their governments, the more successfully can the crisis be overcome. No one can save our cities today except the people who live in them.

Citizens' Councils Take a Hand

Some such idea, as outlined above, but perhaps differently expressed, was in the minds of the seventy civic, business, and educational leaders of this country who issued last spring the call for groups in every American community invested with a civic interest to organize themselves into central, local associations to go to the aid of their own towns and counties. The call has had an immediate and surprising result. Although it was made at the beginning of the lax summer vacation season which has just closed, 41 Citizens' Councils for Constructive Economy are already reported in vigorous operation. The National Municipal League, which acts as headquarters and information service for this movement, reports that late in September, 138 localities, distributed through 40 of our 48 states, are in process of organization. Inquiries as to how to organize, and what objectives reasonably may be set, come from practically every state and run into hundreds.

Study of these inquiries in the files of the National Municipal League throws interesting sidelights on the nature and depth of our municipal difficulties. Seldom are they random requests. Most of our communities are over-organized already, and the American taxpayer has too many things to worry over to permit him to create any unnecessary billows in his sea of troubles. A request for help in organizing a Citizens' Council is a pretty sure indication that somewhere citizens are in specific trouble. Naturally, therefore, teachers and school board members head the list of inquirers. Libraries and library board members are a close second. Then there are lay relief organizations, public health associations, chambers of commerce with worried committees on taxation, municipal research bureaus, tax reform bodies, and municipal improvement associations. Leagues of women voters, parent-teachers associations and city clubs crop up among the groups interested in civic affairs as a whole, who are forming new Citizens' Councils or swinging the activities of existing organizations along these lines.

The Citizens' Councils follow no nation-wide pattern; they are formed to bring citizen aid to local governments in whatever direction the local exigency calls for. Thus in Dayton, among many other places, the Citizens' Council has backed the City Treasury in the fight to make tax delinquents pay up. In Waterloo, Iowa, it has been working with the city government to put through an extensive public works program as a step toward unemployment relief. In Des Moines it is organizing in behalf of a school system whose efficiency is threatened by a reduced budget. St. Louis is one of many cities in which the Citizens' Council is making a thorough survey of the municipal budget and of municipal service, drafting the help of leaders in every branch in the city's unofficial life for the task. These are only a few examples.

The plan is worth the thoughtful consideration of municipal officials. A Citizens' Council has the key to cooperation by the most enlightened elements of a city or town, in many of the grave situations that confront our public officials. They have shown that with proper backing they are capable of rallying public opinion to the support of genuinely efficient government. This has been so evident that more than one city official has himself taken the first step toward the creation of a Citizens' Council to help cope with the difficulties in his own community, as the augmenting records of their organization in the National Municipal League headquarters attest.

EDITORIAL NOTE.—Just as they have no pattern of activity, so the Citizens' Councils have no prescribed functional form. Printed matter as to methods of organization is obtainable from the National Municipal League office at 309 East 34th Street, New York.

The value attached to the Citizens' Councils in our present municipal upheavals is shown by the part reserved for them at the Annual Conference on Government at the Hotel Chalfonte-Haddon Hall, Atlantic City, November 9-11. The subject for the Conference will be "The Part of Local Government in Recovery," which is a topic that needs discussion now if ever. The most pressing questions confronting American municipalities will be discussed. Municipal credit, public works, liquor control, emergency relief, tax delinquency, the plight of police, fire, schools, libraries, and public health services resulting therefrom, are to receive the attention of national authorities in these fields. Citizens' Councils come in for an important share in these deliberations, and a special section in the meeting is being reserved for them, at which reports by delegates from all sections of the country will be presented. It is the first national gathering of this group of citizens' associations, and a large representation is expected.

A Sewage Treatment Plant Among Attractive Surroundings

By E. BENDER

THE attractive and well-kept sewage treatment plant of the borough of Eddystone, Pa., is an interesting example of a well-managed public utility. Officials of this community took a keen interest in the promotion of the project and have given it their utmost support ever since it was placed in operation. The plant is located at Eighth and Eddystone Avenue on an 8-acre tract of land purchased by the borough, only 100 feet from dwellings and from a main highway. There has been considerable interest on the part of various municipalities in Delaware County regarding the abatement of stream pollution. Eddystone was one of the first to respond in this program. Prior to October, 1931, when the plant was dedicated, there was no form of treatment, and raw sewage was discharged into Ridley Creek. Since the plant was placed in operation the sewage has received preliminary treatment followed by chlorination, and it is then discharged into the Delaware River. During the World War the population of Eddystone was much larger than at present, for it was the site of a large war ammunition industry. The population is now about 2,500.

Sewer System and Design Data for Sewage Treatment Plant

The sewer system of Eddystone is composed of 14,500 lineal feet of 8-inch terra cotta pipe, 2,350 lineal feet of 10-inch terra cotta pipe, and 1,900 lineal feet of 24-inch terra cotta pipe. The 24-inch sewer was formerly used as a combined system but is now used for storm water only, and a new 10-inch line has been laid for the domestic flow.

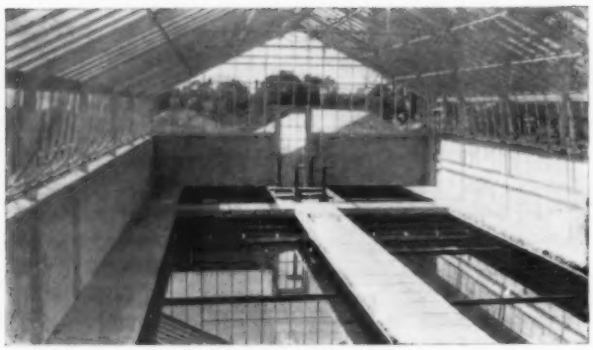
The new plant was designed for a population of 6,000 in 1941, and entirely for domestic sewage, estimating the sewage flow and infiltration in 1941 as 133 gallons per capita per day. The preliminary settling tanks are designed to give 2½ hours detention, the mixing chamber 5 minutes mixing period, and the contact tanks a 25-minute contact. The sludge digestion tanks are designed with a capacity of 2.5 cubic feet per capita, and the sludge drying beds 0.5 square feet per capita. The maximum capacity of each sewage pump is 1,700,000 gallons daily.

Pumping Station

The pumping station substructure is built in two integral compartments and housed with a superstructure of buff brick trimmed with pre-cast stone. One compartment, the wet well, receives raw sewage, first passing through a bar screen at the inlet end. Raking of the screen is done manually from a platform, and the screenings are placed in cans and hoisted to the outside, then carted away and buried. The floor of the wet well slopes in one direction to the high side provided with a perforated spray pipe for flushing. Two Fairbanks-Morse vertical pumps are situated in the dry well, having suction pipes with valves extending into the wet well with their inverts flush with the low side of the wet wall floor, thus affording complete drainage when desired. The inlet pipe is provided with

A GENERAL VIEW OF THE EDDYSTONE, PA., SEWAGE TREATMENT PLANT

The pumping station is shown in the foreground, with the glass-covered settling tanks, mixing and contact tanks in the center, the sludge digestion tanks on either side, and the glass-covered sludge drying beds in the left background



THE COVERED SETTLING TANK, WITH THE SLUDGE COLLECTORS AND ROTARY SKIMMERS, MIXING CHAMBER AND CONTACT TANKS IN REAR

a sluice-gate to check the incoming flow when the well is cleaned. Each pump is driven by a 10-hp slip-ring motor mounted on the main floor 15.5 feet above the center line of the pump. An intermediate floor is located just above these pumps. The laboratory and chlorinator rooms, meter register, wet well depth gage and pump discharge pressure gages are on the main floor of this station. The discharge pipes are arranged so that the sewage from either pump passes through a venturi tube; then the piping branches in a "Y," each leg of which is provided with a gate valve and balancing meter. A manometer is connected to each branch meter, which serves to indicate the proportion of the flow of sewage to each settling tank.

The switchboard includes two automatic control panels. At the rear of each a pedestal is set containing a series of toggle switches which operate magnetic contacts on the face of the board. Floats for operating these switches ride in cast iron stilling wells with aluminum pipe stems extending into the pedestals. A suction head is maintained in the wet well for prime, and with an increase in level of 6 inches, the pump starts automatically at a reduced speed. The rate pump at the starting step is 200 gpm, and as the level continues to rise in increments of 3 inches, the speed of the motor increases, and accordingly the rate increases 200 gpm for each additional 3-inch rise until the rated capacity of 1,200 gpm is reached, corresponding to a total rise of 15 inches. As the level recedes, the operation is inverse. Each pump is provided with the same automatic control features. However, as one is used as an auxiliary or an alternate, each unit may be operated continuously at various steps between 200 and 1,200 gpm by means of a transfer switch and manual drum type controller.

Settling Tanks

There are two settling tanks, each 12 feet wide by 52 feet long and 10.5 feet deep, with a flow depth of 9 feet. They are equipped with sludge collectors, manually operated skimmers, and sludge withdrawal pipes. Settled sludge is pushed into hoppers, from which it is removed by hydrostatic pressure to sludge wells at the inlet end of the digestion tanks, and the scum which is taken off by the skimmers is also returned to these wells. Sludge hoppers are provided with spray pipes and a blow-off, the latter being piped to the wet well in the pumping station. These tanks are fully enclosed with Lord & Burnham greenhouse-type structures, which also house the mixing chamber and contact tanks.

Mixing Chamber and Contact Tanks

The effluent from the settling tanks passes over weirs into a mixing chamber 4 feet wide by 11 feet long by 10.5 feet deep. Chlorine is applied through a perforated grid to the sewage as it enters this chamber. The chlorinated sewage then passes over and under a number of wooden baffles to the contact tanks, which are located on each side of the mixing chamber. They are 9.75 feet by 11 feet in plan by 10.5 feet deep, and equipped with around-the-end type baffles. The final effluent flows over V-notch weirs and through approximately 3,000 feet of cast iron pipe to a submerged crib in the Delaware River.

Sludge Digestion Tanks

A digestion tank 12 feet wide by 65.5 feet long by 10.5 feet total depth is located on each side of the settling tanks. Raw sludge and scum from the settling tanks enters a sludge well at the end of each digester. In each well there is a 150-gpm pump which discharges into the digesters. Sludge collectors, gas domes, heating coils and telescopic decantors are provided. Liquor may be decanted from any depth desired, and after percolating through the sludge drying beds it is returned by gravity to the wet well in the pumping station.

Ripe sludge is raised by hydrostatic pressure to inspection boxes and thence to the drying beds, or a portion returned to the sludge wells for seeding or circulating. Gas is collected in a raised section of the digesters where oil-sealed domes are located. A gas line is carried underground to the burning-equipment on the intermediate floor of the pumping station. Gas for starting and make-up is taken from the commercial gas company's main. The make-up gas is automatically supplied to the burners when the amount from the digesters is insufficient. Water in heating coils is circulated by two centrifugal pumps

THE LOWER FLOOR OF THE PUMPING STATION, SHOWING THE RAW SEWAGE PUMPS AND PIPING

through a water meter, and each supply line to the digesters has an orifice plate, a U-type manometer and a regulating valve. Recording thermometers are inserted in the supply and return lines inside the pumping station, and a recording thermometer is also installed in each digester, with the instruments in the glass enclosure over the settling tanks.

Glass-covered Drying Beds

Ripe sludge to be dewatered is received by a concrete channel in the drying bed. Six beds are provided with open joint tile underdrains resting on a concrete slab. The liquor drained is returned to the wet well. The beds are completely covered with a Lord & Burnham glass cover.

Improvement of Treatment Plant Site

Because of the close proximity of dwellings and a main highway, it was necessary to take precautions against nuisances that might occur from odors and also to ensure that the plant would in no way detract from the surrounding neighborhood. The various tanks are fully enclosed and the pump suction well is vented. The lawns were seeded and embankments sodded. Trees and shrubbery were also planted, and benches have been placed on the front lawn for pedestrians and visitors. Driveways were constructed around the plant and a cement walkway laid from Eddystone Avenue to the pumping station, a distance of about 100 feet.

Operation

There are three shifts, which are covered daily by the chief operator and two assistants. The operator takes care of the analysis and records. Screenings are removed once daily and the raw sewage pumps are alternated every 24 hours. The sludge collector in the settling tank is operated twice daily for about 30 minutes, and likewise the collector in the digester. Raw sludge is then removed and pumped into the digesters at the same time that the displaced supernatant liquor is decanted. At present the contact tanks are alternated once a week and flushed with water. The chlorinator operates continuously. Scum and other visible matter which detracts from the appearance of the plant is removed and disposed of at frequent intervals.

Contracts for the structures, piling, grading and sewer outlet, as well as for the installation of the mechanical and electrical equipment were awarded in February, 1931. The total cost, including the tract of land, was approximately $144,500. Damon and Foster, of Sharon Hill, Pa., were the consulting engineers for this project. When the plant was placed in operation, the borough retained the consulting engineers for a period of one year to supervise and instruct the operator as to details and analytical determination necessary for proper operation.

Fish-Rutherford, Inc., of Philadelphia, Pa., was the contractor for the structures, piling, grading and outlet sewer and Roberts Filter Mfg. Co., of Darby, Pa., received the contract for furnishing and installing the mechanical and electrical equipment.

PWA Appoints Technical Board of Review

APPOINTMENT of twelve outstanding engineers and technicians as members of a Technical Board of Review for the Federal Emergency Administration of Public Works was announced last month by Administrator Harold L. Ickes. They are:

Colonel Carey H. Brown, 183 Main Street East, Rochester, N. Y.
David Cushman Coyle, 101 Park Avenue, New York City
Howard P. Emerson, 1900 R Street, N. W., Washington, D. C.
Harrison Prescott Eddy, 1300 Statler Building, Boston, Mass.
Walter Philip Henry, 75 West Street, New York City.
Malcolm Pirnie, 25 West 43d Street, New York City
Frederick Hall Fowler, 1300 Crocker First National Bank, San Francisco, Calif.
Wesley Winans Horner, 300 City Hall, St. Louis, Mo.
Richard Sutton Buck, Crozet, Albemarle County, Virginia
Samuel Arnold Greeley, 6 North Michigan Avenue, Chicago, Ill.
Clarence A. Dykstra, Cincinnati, Ohio
Irving B. Crosby, 6 Beacon Street, Boston, Mass.

The Board will consider the qualifications of particularly difficult or controversial projects which are referred to it by the Administration for review. It will also serve in a quasi-judicial capacity and hold open hearings on projects when public opposition develops and such hearings are required.

Another function of the Board will be that of a court of appeal on request of the Public Works Administration when proponents of some project feel that it has not received full consideration or that supplementary facts have been obtained which may shed new light on the qualifications of a project.

When a project is referred to the Technical Board of Review, it will receive a fresh and impartial study of the fundamentals as presented in writing by the Public Works staff and the applicant or protestant. After such study, due notice will be given when an open hearing is to be held for full verbal presentation of facts and opinions of all concerned. Such hearings will not be too legally technical, but reasonably informal so that all pertinent facts are obtained. The Board will transmit its opinion to the Deputy Administrator without making public the opinion.

Types of projects referred to the Board include:

Projects which have been adversely reported on by state boards or by the staff at Washington, which in the opinion of the Deputy Administrator warrant review.

Projects which are protested against by outside parties, groups or other organizations, which protests are, in the opinion of the Deputy Administrator, serious enough to warrant review.

Projects approved in principle by the Deputy Administrator but of such an unusual size or character and involving such difficult questions of engineering, finance or law, that in his opinion they warrant review.

The Board will consider projects that qualify under the yardstick of policies previously announced by the Administration.

For the personnel of State Engineers, State and Regional Advisory Boards, and Regional Public Works Inspectors for PWA, see pages 5, 75 and 79 of the September issue.

The Public Works Fund in Relation to Street and Highway Pavements

By HUGH W. SKIDMORE
Consulting Engineer, Chicago Testing Laboratory, Inc.

ASPHALT, brick and concrete pavements of the higher order will unquestionably come back into their former prominence. They may not—probably will not—return in alphabetical order with respect to their relative yardage ranking, but it seems certain that they will return and reasonably soon. In the ultimate scheme of things those items of greatest long-time merit and economy will prevail. This truth will be just as certain in the case of pavements as it has always been in connection with all utilities necessary to the orderly and economical upbuilding of man's essential needs. We are not yet ready to dispense with high-grade pavements.

Many of the so-styled low-cost roadways will eventually function as good beginnings for high-type surfaces, even though in many instances they will prove to be more expensive than they would have been if just a little more foresight and a little less emotion had been present initially. Of course, many miles of these roads will continue to serve well and cheaply the demands made upon them for years to come. But they will not all do so, nor was it so considered by engineers who looked ahead.

No Highway of Today Is Permanent

Highways are like all other utilities; they are not permanent, they require maintenance, and they likewise require strengthening and remodeling in the interest of economy and growing service demands. It would be plain foolishness to consider that the advent of low-cost surfaces has solved the highway problem, notwithstanding the fact that these initially cheaper types have lately occupied the major portion of the highway engineer's concern. They have done so as the result of one prime reason: there is still a crying demand for more and more miles of highway simultaneously with a reduction of funds with which to supply them. This relation of funds to demands has resulted in the construction of many miles of low-first-cost highways where the interests of long-time economy would have been better served by the application of more money to fewer miles of more durable structures.

Fortunately, these investments have not been wholly lost, because in most cases they may be at least partially salvaged when more permanent surfaces are built, providing this is done early enough. The construction of expensive high-type pavements where low-cost structures would have served has likewise been severely and justly criticized. The latter case is obviously more serious than the former, which at least has the argument of more miles of serviceable road in its favor.

A serious condition has already developed in cities due to lack of adequate maintenance and failure to resurface worn pavements in time to redeem most of the original investment. The situation has been alleviated in a few cases of main arteries by reason of state highway departments stepping in and resurfacing or repaving so as to keep trunk highways passable. Municipalities in general all over the country have failed utterly to even maintain the present investment of their taxpayers in street pavements. Means to correct this situation will have to be found very soon. It has seemed pretty obvious that a considerable portion of local relief money could have been utilized in this manner, but evidently this has not been apparent to most of the politicians who have dispensed these funds.

Street Repairs Are an Immediate Necessity

Certain fundamentals have been stipulated by the Public Works Administration in dispersing funds to local governments. Projects must be sound, economical, well conceived, planned and financed, and they must be needed improvements. This is exactly as it should be, since it is just good business. It has always been an essential rule of good business to apply timely improvement and rehabilitation to present plant. Only rarely does it pay to junk plant and equipment for entirely new structures. This comes only as a last resort when present facilities are wholly inadequate for operating demands by reason of obsolescence or destruction under severe service.

There is no question but that many soundly conceived and badly needed sewerage, water-supply and similar utilities should and will receive Federal aid through the Public Works Administration. By the same token, and in many cases with even a greater degree of real economy and need behind them, municipalities should be loaned funds for resurfacing and otherwise rehabilitating and improving pavements, exclusive of routine maintenance.

Federal funds by way of P.W.A. should be available for sound projects of this nature in addition to the $400,000,000 initially assigned to state highway departments, since the use of this money is narrowly limited so far as cities and towns are concerned. Inasmuch as aiding unemployment is the sole purpose of the Public Works Fund, it is doubtful if wider and more useful distribution can possibly be accomplished through any other form of construction activity. Nor can any other utility offer at this time a more fertile field for truly economical expenditure of public money.

Cities throughout the country are faced with the inescapable duty of providing serviceable streets and highways. A large percentage of present systems is sadly in need of new surfaces, wider roadways or new pavement. From the standpoint of health, convenience and economy, there is little if any difference between good roads, adequate

sewers and wholesome water supply. They, together with gas and electricity, are essentials of urban life. The only possible discrimination which should be applied in allotting Federal funds to such projects is that of actual need of the community, tempered by the fiscal soundness of the plan.

Plans and specifications for paving projects of this nature are comparatively simple and can be quickly prepared. Certainly, municipalities should be setting up needed improvements of this kind so that they may be promptly submitted to state boards and district administrators—and yet comparatively few of them are doing so.

Repairing Old State and County Bridges

By **FRED KELLAM**
Assistant Chief Engineer, Indiana State Highway Commission

THE state and the various counties have on their highway systems a great many old bridges. These bridges have been built at various times and according to various ideas of design and construction. Naturally, few of the older ones were ever adequate for the heavy loads of today—which are beyond the wildest dreams of only a few years ago. Also, these bridges have been exposed for years to the ravages of time, wind and weather, floods and fire, decay and rust, freezing and thawing, and, above all, the hammering and battering of traffic. Few have wholly escaped some damage from one or more of these agencies of destruction. Considering these things, we find that the problem of determining the load capacity of old bridges and making repairs to restore or improve them presents an almost infinite variety of questions in detail.

The early replacement of all our weak and crippled bridges would overtax our resources under the most favorable conditions. Under the present economic situation, it is even more necessary that we patch up our old bridges and make them serve as well as we can until funds become available for replacing them.

Ingenuity and Judgment Needed

This problem of figuring strength and working out repairs is hard to discuss in a general way. It is largely a question of ingenuity and judgment, and often the mechanic and handy man is better in these respects than the engineer or technician. Some people are naturally ingenious and resourceful in a mechanical way, and others are not and never will be.

For this reason, it is vital that the foreman selected to handle bridge repairs in general, or in any specific case, should be carefully chosen with these things in mind. I can think of no place where more time and material can be saved or wasted than in making repairs of this character. However, even the best-qualified foreman may fail utterly through lack of appreciation of fundamental engineering principles, and this is where careful supervision by the county engineer or highway superintendent is important.

Some Pitfalls and Common Errors

The methods for figuring load capacity are covered in the standard textbooks, and I shall not attempt to go into the details of the calculations here. R. B. Yule, Engineer of Bridge Location for the Bridge Department of the Indiana State Highway Commission, has worked out instructions in detail for making surveys and calculations to determine the maximum load capacity of bridges, instructions which are being followed in determining the load limits to be recommended to the Commission under the 1931 truck law. For this purpose we are using unit stresses approximately twice as high as those used in design. Since such heavy penalties are fixed by the law, it appears to us that we should do this, thus reducing the factor of safety so that we prohibit only loads which are very likely to damage the structure.

It should be understood that in many cases there are unknown elements of strength which enable a structure to carry even higher loads. I have personal knowledge of many cases, and authentic reports of others, where bridges have temporarily stood and carried traffic with some essential part broken or missing. But of course it is utterly unsafe to depend upon these factors, because most of them will fail to help under certain conditions, and this may happen at the worst possible time with serious consequences.

The changes in traffic in recent years have resulted in much heavier concentrations of load, with much smaller increases in the total load for which trusses are designed. Consequently, we have found that in old steel truss bridges the stringers are almost invariably the weakest part of the bridge. Occasionally the floor beams or floor beam hangers or connections are the limiting point, and more rarely some member or connection of the truss. Of course, this may be changed by rust or other damage to other parts of the bridge.

Because of these facts we have for some years used a simple formula for roughly calculating the probable safe load capacity of steel bridges. This formula is as follows:

$$L = \frac{267S}{ls}; \quad \text{where}$$

L is the gross truck load in tons—40 per cent on each rear wheel,
S is the section modulus of the steel stringer in inches^3,
l is the stringer span in feet, and
s is the stringer spacing in inches.

This formula is based on a stress of 16,000 pounds per square inch for steel. The result should be doubled if the maximum load which will not cause permanent damage is desired. This formula disregards the weight of the floor and floor system, which makes very little difference in stringers under normal conditions. For heavy floors and long stringer spans, the dead load should be figured.

For the reasons set out above, one of the most common bridge repairs is the replacing of the floor or floor system. If the stringers are to be replaced with stronger ones, the other elements of strength of the bridge should be carefully studied and no money wasted in making the stringers

stronger than the rest of the bridge. Also, the floor should not be greatly increased in weight unless it is certain that the floor system and trusses are sufficient to carry it. I have known a number of bridges to be overstressed or even broken down by the weight of a concrete floor, when the bridge would have been quite satisfactory if a lighter floor had been used.

One very important matter to consider in a bridge floor is impact and its closely related companion, vibration. I recall vividly one case where a dangerous condition was found just in time to avoid a serious accident. In the White River bridge west of Martinsville, Ind., an experimental section of laminated floor was installed. This floor was 4 inches thick, while the old double plank floor was 6 inches thick, leaving a 2-inch offset at the point where the two types joined. One panel of stringers next to this offset was bent down from 2 to 6 inches by the impact resulting from this condition, while the other stringers in the bridge were in excellent condition.

In another case a bridge with a single plank floor was so loose that its rattling could be heard for a mile when a car crossed it at high speed, and it was locally regarded as a weak and dangerous bridge. When a smooth longitudinal floor was placed on top, the vibration was almost entirely stopped. There were no further complaints about this bridge.

If one of the truss members of a bridge is damaged, the repair or replacement of the member is largely a matter which any good mechanic can work out. Care should be taken to see that bolt or rivet holes are not so located as to weaken the repaired member and that the repair does not throw the stress badly off the line of the member. The big problem is to keep the bridge from falling down while the repair is being made. Usually the safest, simplest, and cheapest way is to put a bent under each floor beam to support the bridge while the truss member is out of service. Sometimes one or two such bents will do, but this is a risky plan unless the distribution of stresses in the truss under these conditions is carefully investigated, and the overstressed members strengthened. In the reconstruction of the Wabash River bridge on State Road 34 at Covington, Ind., traffic was carried on a truss span which was strengthened and supported at the first panel point while an abutment was torn out and a pier built in its place.

In many cases, if live loads are kept off the bridge, a temporary member may be used to permit the removal and replacement or the repair of the member without removing it. This was done in repairing a damaged hanger in the Broad Ripple bridge over White River on State Road 31. In the double intersection truss bridge over the Wabash River on State Road 1 at Bluffton, Ind., several compression verticals were buckled. The cost of falsework in this case would have been excessive. These members were straightened in place all at once by specially designed clamps and beams and without the use of falsework. The clamps and straightening beams were left in place, resulting in members stronger than when they were built, though rather clumsy in appearance.

A discussion of this subject would not be complete without reference to one rather common mistake. When a bridge as a whole shows signs of weakness, it is only natural to think of putting an additional support in the middle of the span. In the case of slab, beam, or girder bridges, this is an effective device for strengthening the structure, but in the case of truss bridges, it may even have the opposite effect. A rather simple stress analysis will show, unless certain members are reinforced or new ones added, that under certain conditions a simple pratt truss with an extra support at the center of the span may actually fail under a concentrated load which it would safely carry without the center pier.

ACKNOWLEDGMENT.—From a paper presented at the Nineteenth Annual Road School, Purdue University.

Federal Public Works from the Viewpoint of a Chamber of Commerce Executive

DISCUSSING public works planning in relation to unemployment relief, at the annual convention of the National Association of Commercial Organization Secretaries, in New York, September 27, the point of view of the forward-looking chamber of commerce executive was effectively presented by Samuel B. Botsford, Executive Vice-President of the Buffalo Chamber of Commerce. The full paper will be published in the convention proceedings. A brief excerpt follows:

"Probably we would all be glad to support a well-planned scheme of this sort under Federal control, on a long-range basis, put into active operation for the generation ahead of us. Probably it is the best program to support, once it is assumed that some sort of continuous relief effort is going to be necessary. In a period of depression such work is particularly beneficial to the capital goods industries, which suffer most at such times.

"If we assume continuance of private initiative, we must expect the ups and downs in business that private capitalism brings. Whatever amount of cooperative control in industry we retain out of the present experiment under President Roosevelt, I certainly do not think we shall fail to restore that essential private control which has been such a vital factor in American industrial progress. We must and should fight for its retention, and at the same time urge preparation for the known results of its defects. In this spirit I advance the idea that nation-wide planning of public projects, on a scale at least as large as that embodied in the public works bill of last spring, represents the sort of intelligent modification of private capitalism that we will probably accept and retain.

"The contention was frequently heard a year ago that work projects are too expensive for the relief that they bring. If projects are undertaken on a national scale, this objection obviously loses much of its force. But the burden of public debt worries chamber of commerce members. Let me stress the fact that the creation of government debt to finance such projects does not at all offset the tremendous shrinkage of private debts that has been going on in the last four years. The statistical shrinkage in bank credit of between 15 and 20 billions does not tell the whole story. Private and trade debts that have been liquidated must be added. The crushing consequences of this need not be stressed; they have been so obvious to all of us. Under such conditions as now exist (and would exist in another depression) the counter-creation of government debt is somewhat beneficial. *It partially checks the paralyzing process of liquidation.* In succeeding years of confidence and renewed willingness to undertake private obligations, the public debt can be reduced."

The Careful Development of Garbage Disposal in Milwaukee

By PAUL M. JOHANNING
Mechanical Engineer, Department of Public Works

MILWAUKEE covers an area of 44.094 square miles and has a population of 601,800 according to the census of 1932, all of which is served with garbage collection service. All garbage is disposed of without a special charge therefor, and all household garbage is collected without a special charge, but is paid for by the general tax levy. Markets, restaurants, hotels and all commercial houses are charged 20 cents for the collection of a 20-gallon can of garbage. Coupon books are sold for this purpose, thus avoiding the handling of cash by the garbage collectors.

The disposal plant is located on the lake front at the harbor entrance about one mile from the City Hall, or about one-half mile from the commission house district, which more or less forms the extreme of the business district. The area from the commercial houses to the garbage incinerator is mostly occupied by light manufacturing and warehouses.

The First Incinerators

The disposal facilities consist of an old plant built in 1909 and a new incinerator which may be considered complete at the present time. The old plant was built by the Power Specialty Co., which was at that time licensed to utilize the English patents. The design, material and workmanship used on this job were really a credit to all concerned with the plant at that time. As constructed in 1909, the plant consisted of a building 100 feet square containing four Heenan and Froude furnaces, each guaranteed to dispose of 75 tons per 24 hours and each built in connection with a 200-hp water tube boiler. The guarantees were based on a ratio of 60 per cent garbage and manure and 40 per cent ashes and rubbish. No exact definitions were given as to what constituted garbage, manure, ashes, or rubbish. The contour of the area surrounding the plant is such that a ramp is impractical, and therefore cranes were installed in the plant to hoist the wagon bodies containing garbage to dump their contents on the feeding floor. In 1911 a turbine room with a 600-kw condensing turbine was added. Owing to the absence of what is usually called "horse-sense" in conducting the operations, the repairs were neglected and the plant was almost a complete wreck in 1922.

GARBAGE PIT OF THE NEW INCINERATOR, SHOWING A TRAILER DUMPING AND THE CLAMSHELL READY TO HOIST GARBAGE TO THE FEEDING FLOOR

Collection Equipment

The equipment used prior to 1923 for collecting consisted of 125 one-horse wagons each with a man operating as an individual contractor. Each collector was expected to deliver two loads of garbage per day, for which he received $7.

Manufacturers made efforts to sell side-dump trailers for the collection of refuse, but their product was not looked upon with much favor until such equipment was tried for the collection of garbage in 1923. As a result of these experiments, a trailer system was shortly afterward adopted for garbage and extended to the ash and rubbish collection and later for hauling other material as well. To accommodate the use of the garbage trailers, it was necessary to build a pit in which to dump the garbage, and to install new cranes with clamshells for hoisting the garbage to the feeding floor.

In 1928 runways were built into the basement of the plant to provide for dumping clinkers directly into the same garbage and refuse trailers and thus removing the clinkers to the dump without rehandling.

With the installation of the trailer system in the garbage bureau, a better supervision and inspection organization was instituted and gratifying results were obtained. Complaints have decreased in number from 23,858 in 1923 to 372 in 1930, and 491 in 1931. On account of the unemployment situation in 1932, it became necessary to shorten the hours of labor per week, thus increasing the number of men employed, which in turn made it necessary to shift men considerably and caused 949 complaints in that year.

Disposal System Enlarged by Bond Issue

From the experience of prosperous years in which much garbage was produced, it was evident that the garbage disposal facilities were rapidly becoming inadequate during the peak season—which practically means insufficient regardless of time. Therefore, plans were made for plant enlargement. The writer was placed in charge of this work and made a study to determine how the garbage-disposing facilities should be enlarged. In accordance with the study, estimates were made and a bond issue authorized. General plans were made and specifications written on which garbage incinerator builders could bid. The bids included only the furnaces together with all appurtenances necessary to burn garbage. This included forced-draft fans, charging hoppers and gates, air preheaters and

CHARGING FLOOR, SHOWING TWO CLAMSHELLS READY TO DROP GARBAGE DIRECTLY INTO THE CHARGING HOPPERS

a smokestack. The Goder Incinerator Co. was the low bidder and was awarded the contract. A building was then designed and constructed into which the furnaces and appurtenances would suitably fit.

This building was designed to receive garbage from side-dump trailers, but merchants choosing to deliver their refuse may dump their garbage into the pit through a side door without interference with the city's trailer delivery. These pits, one at each end of the building, are designed to hold 180 tons of garbage, or 80 per cent of the capacity of the furnaces per 24 hours. Cranes with clamshells similar to those purchased in 1923 for the old plant were installed in the new plant to take the garbage from the pits and deliver it directly into a charging hopper, thus avoiding all the feeding of garbage to the furnaces with hand labor, which is so common in disposal plants.

The experience in Milwaukee has been most favorable to the use of cinders from the city's pumping stations and similar boiler rooms rather than the purchase of coal for the necessary additional heat units for burning garbage. Thus cinders are added to the garbage in the charging hoppers. The gates of the charging hoppers are operated by means of an air cylinder and are under the control of the fireman. In cleaning the fires the clinkers are dropped through a dumping dead plate according to our specifications, and fall directly into trailers. The ash floor is ventilated by the suction of the forced-draft fans. Due consideration has been given to sanitation in the building, as is shown by the large amount of glass mounted in steel sash, and the large amount of glazed brick on the inside walls and on the furnace exterior; corners were avoided as much as possible, and a liberal drainage for washing was provided.

Most cities contract for and expect to receive a complete plant. The cost for constructing this plant as usually considered complete was somewhat less than $200,000 for a rated capacity of 225 tons of garbage per 24 hours. This cost, however, covers a construction far superior to that usually found in complete contracted plants.

The furnaces were originally contracted for in 1927. Owing to differences of opinion regarding location, the construction was delayed, but it was finally placed adjacent to the old building. After the plant was completed, the furnaces were tested in accordance with the guarantees and a settlement was made. Thereafter the furnaces were operated and experimented with by the writer. These experiences showed that certain changes were desirable and advantageous. Alterations were made in one furnace, and during the time the second furnace was corrected further experience was received from the first furnace. The corrections are complete enough, and tests have been run which show that the plant will exceed expectations.

Labor Required

The labor required to operate the new plant is about as follows. A craneman and a feeder are required on the upper floor when the plant is in operation, regardless of the number of furnaces in operation and regardless of the amount of garbage to be disposed of. One fireman can dispose of 16 to 18 tons of garbage per 8-hour shift. One man is used to clean the building, help clean fires, and do various other odd jobs. A pit man divides his time between the new plant and the old plant, to assist in dumping the garbage into the pits and clean the trailers and sweep around the buildings. A foreman also divides his time between the two plants.

Costs

The total power and light consumption for the new plant, the old plant, the plant office and the garage for the collection trucks is about 8.8 kwhrs per ton of garbage.

Items necessary for an absolute total net cost, seldom, if ever, included by any cities in their operating cost, are interest, depreciation, and taxes or loss of taxes. Repairs in this plant have not been made except minor items due to faulty design or construction.

With the above information it should be possible to compare the present cost of disposal in any location with that of a plant similar to our new plant in Milwaukee.

New Officers of the United States Conference of Mayors

AT the annual meeting of the United States Conference of Mayors, held in Chicago, September 22-23, the following were elected to serve for the ensuing year:

President, Mayor T. Semmes Walmsley, of New Orleans; Vice-President, Mayor Daniel W. Hoan, of Milwaukee; Secretary, Paul V. Betters, Executive Director of the American Municipal Association. Trustees, Mayor Meyer C. Ellenstein, of Newark, N. J., Mayor Angelo V. Rossi, of San Francisco, and Mayor C. Nelson Sparks, of Akron, Ohio. Advisory Board members, Mayor Joseph K. Carson, Jr., of Portland, Ore.; Mayor R. E. L. Chancey, of Tampa, Fla.; Mayor James E. Dunne, of Providence, R. I.; Mayor George W. Hardy, Jr., of Shreveport, La.; Mayor Oscar Holcombe, of Houston, Texas; Mayor Edward J. Kelly, of Chicago, Ill.; Mayor Louis Marcus, of Salt Lake City, Utah; Mayor William Mahoney, of St. Paul, Minn.; Mayor Walter G. C. Otto, of New Rochelle, N. Y.; Mayor John P. O'Brien, of New York City; Mayor Watkins Overton, of Memphis, Tenn.; and City Manager C. A. Dykstra, of Cincinnati.

Excerpts from Secretary Ickes' challenging speech appear on the front cover and page 5 of this issue.

The Reduction of Corrosion in Water Pipe

By EDWARD S. HOPKINS

Principal Sanitary Chemist, Bureau of Water Supply, Baltimore, Md.

CORRECTIVE treatment with lime to retard cold-water corrosion of pipe lines has been more or less continuously practiced in the Baltimore supply during the past ten years. The initial treatment in 1922 utilized a pH value of about 8.3, producing a slight "egg-shell" precipitate of calcium carbonate in the mains, thereby forming a protective coating on the pipe. This treatment has been gradually reduced, and after four years the egg-shell coating was found to be intact, with the water at a pH of approximately 8.0. Changing buffer characteristics of the water, together with regulation of the lime application by the von Heyer marble test, has made possible the maintenance of this coating with a pH value of 7.9 for the past two years.

To demonstrate the practicability of this treatment and to learn whether adequate protection was being given, a study was made of the corrosive properties of the cold water as supplied in two large office buildings. These buildings are on a direct service and are about six miles from the plant. Building "A" is 3½ years old, contains about 1,900 linear feet of galvanized iron pipe ranging in size from 4- to 6-inch diameter, with 1,100 feet of red brass pipe serving as lateral distributors, having an average diameter of ½-inch. Building "B" is 28 years old, with approximately 3,500 linear feet of iron piping serving as risers and lateral distributors.

Samples were collected for a period of eleven months from taps on the inlet line and at the farthest point in the buildings. They were tested for dissolved oxygen, iron and pH. The absorptive reagents for oxygen were added to the sample immediately after filling, and the test was completed in the laboratory following a time lapse varying from 40 to 60 minutes. Detailed analytical data are given in Table 1. (See page 53.) It is apparent that no "aggressive" carbon dioxide is present and that water with a pH value at the saturation point of calcium carbonate deposits a coating that retards corrosion. This is proved by the unchanged pH in these lines. The iron content of the water in building "A" was not changed, and in building "B" increased only 0.01 ppm, indicating that slight corrosion is occurring on the older pipe. It is unfortunate that the dissolved oxygen values in building "A" are erratic. Investigation disclosed that this system is fed through a float-controlled storage tank open to atmosphere, introducing an equilibrium variable. Building "B" with a closed circulation system gave evidence that oxidation is occurring with immediate precipitation of the hydrated ferric oxides by the alkaline water, resulting in a minimum amount of corrosion. These data prove conclusively that *all* aggressive carbon dioxide has been neutralized and that the protective film is in good condition. This deposition of alkaline hydrated calcium-ferric oxides in the old, previously corroded pipe, has eliminated "red water" and reduced complaints to a negligible factor.

Contrary to experience elsewhere, an inspection of Table 2 discloses that after passage through about 1,500 miles of pipe lines and a double set of balancing reservoirs there is no reduction in the pH value of this water. The results given in this table are averages of weekly samples taken from 29 stations scattered throughout the system. Excluding Saturday and Sunday, at least one sample per day was collected from each of the four types of services. The plant data are an average of tests made every two hours on the water entering the mains. The remarkably close agreement of these results is noteworthy. It is believed that when a decrease in the pH value of water in pipe lines at extended distances from the plant occurs, the initial alkalinity and pH are below the calcium carbonate equilibrium saturation point, permitting free carbon dioxide to be present.

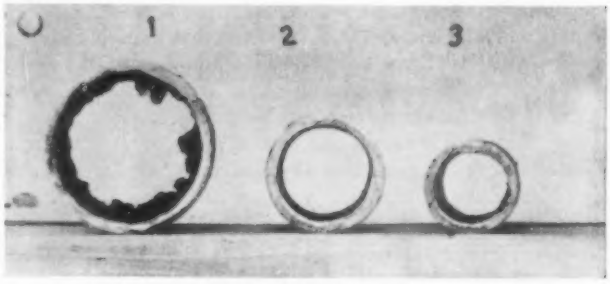


FIGURE 1.—PIPE SPECIMENS FROM THE LOW-PRESSURE SERVICE IN BALTIMORE, MD.

The practical value of this control is shown by Figure 1. Pipe 1 is about 20 years old while the others are about five years. These specimens were taken from the low service, having comparable conditions to that in the buildings under test. The effect of the lime treatment is apparent, showing that protection is conferred upon the pipe eliminating tuberculation, pitting or closure of the bore by incrustants.

The problem of *cold-water* corrosion in pipe can be easily solved. It appears to be essentially production of a water free from aggressive carbon dioxide and at the saturation point of calcium carbonate. This material will then be precipitated in the rust deposited in the mains. A carbonate-alkalinity balance must be maintained at all times to check a decrease in pH after passage through open reservoirs or considerable distance in the system. It is possible to reduce this type of corrosion to a negligible factor by utilization of this control. This is confirmed by the condition of the pipe in Figure 1.

A presentation of the fundamental reactions governing cold-water corrosion was given at the 69th meeting of the American Chemical Society in 1925. Speller, discussing the electro-chemical theory in this symposium, suggested that iron will dissolve in normal waters with production of atomic hydrogen sufficiently fast to keep a film of it on the metal. Therefore, the rate of corrosion is determined by the reaction of the dissolved oxygen to form

water or by production of molecular hydrogen. In neutral or alkaline solutions this rate is governed by the oxygen reaction, and in acid solutions by hydrogen production. He also presented a curve by Whitman, Russel and Altieri which "indicates the relative effect of H ion concentration on corrosion of steel in water which does *not* form protective coatings." The conclusion to be drawn from this curve is that with *bright* iron surfaces pH values between 5.0 and 9.0 are of equal merit in retarding corrosion. However, when it is possible to deposit rust formed by alkali waters, such corrosion will be checked. In addition to this deposition, it is apparent that the solubility of iron in water of low H ion concentration, with all aggressive carbon dioxide eliminated, is quite small. Therefore if an alkaline material can be precipitated on the pipe with the rust, it is obvious that a more or less uniform dense, compact, protective layer of hydrated ferric oxide and the alkali salt, assume calcium carbonate, will adhere to the metal.

To control corrosion in water pipes, since oxygen cannot be removed, it is necessary to eliminate all factors causing a breakdown of this protective rust film formation. Aggressive carbon dioxide is the most common factor found in natural waters, and it is the amount of carbon dioxide present that is capable of dissolving carbonates. Removal of this corrosive agent is accomplished by absorption in lime water with a resultant precipitate of calcium carbonate if the concentration is above the solubility point. Baylis has shown that if water is kept at this point, the products of corrosion are precipitated as a protective coating with reduction of tuberculation in old pipe and curtailment of pitting in new installations.

These theories explain the increase in H ion concentration or pH decrease, found in many pipe lines. An example cited by Hechmer is characteristic. The initial pH in this supply was about 7.4 with a value of 6.6 at the end of the line. This is below the saturation solubility point of calcium carbonate for this water, pH 8.5—9.0, as shown by the Baylis curve. To remove *all* aggressive carbon dioxide would probably require caustic alkalinity and it is therefore impractical. The failure to eliminate this carbon dioxide accounts for the decreased pH values.

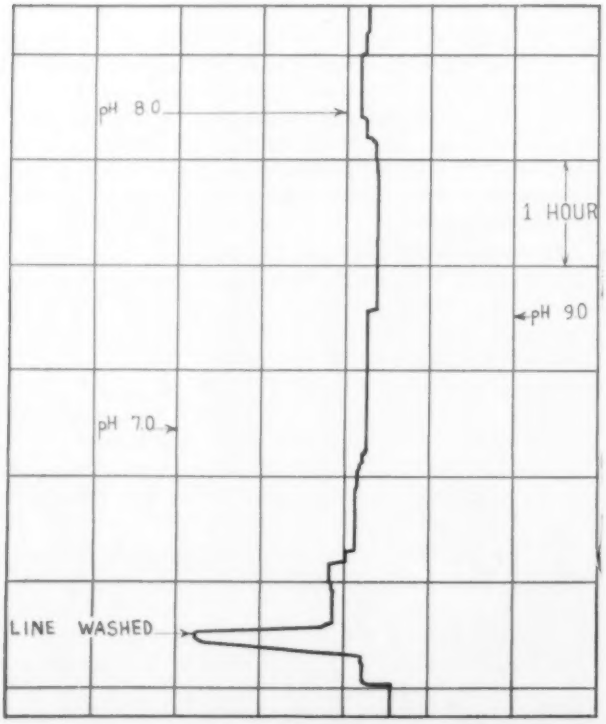


FIGURE 2.—SECTION OF A PERMANENT H ION CONCENTRATION CHART OF WATER DELIVERED TO THE MAINS

The increase in dissolved iron, always true for this type of water, indicates that a breakdown of the rust oxides has occurred. As is well known, the slight solubility of ferrous bicarbonate in water is in direct proportion to the concentration of carbon dioxide present in the free state; therefore, soluble iron is a function of aggressive carbon dioxide. The drop in pH suggests that a large proportion of this iron has been again converted into the higher oxides by the excess dissolved oxygen present, with reliberation of carbon dioxide. When excess oxygen is absent, it is noted that an increase in carbon dioxide is not found. It is generally conceded that iron rust is porous. Realizing this fact, it is suggested that the oxygen loss found in corroding pipes, under these conditions, is utilized to stabilize the lower oxides and also diffuses to the iron surface, combining with the film of atomic hydrogen in accordance with Whitney's theory.

This belief is supported by the data obtained in building "B." The slight increase in soluble iron is caused by diffusion of the oxygen through the porous rust coating to the iron surface with conversion into ferrous bicarbonate. In the alkaline water it is immediately re-precipitated as a hydrated oxide with only that portion remaining in solution in accordance with its slight dissociation constant. Owing to temperature increase in the lines in this building, the water from the outlet tap was always saturated with oxygen, gas bubbles being given off to atmosphere upon drawing the sample. Considering this condition, it is questioned whether the oxygen decrease in these lines is indicative of corrosive activity in proportion to the loss noted, 0.86 ppm as average.

Continuous Lime Application Needed for Pipe Protection

As previously stated, this study stresses the necessity of *continuous* lime application to give pipe protection. It cannot be intermittent. The water must always be kept at the calcium carbonate saturation point as shown by the pH value for each source, if practical. With certain soft waters this cannot be done without producing caustic alkalinity. To adequately regulate such treatment, automatic devices are invaluable, enabling the operator to maintain pH values within narrow limits of error, not possible by occasional determinations with color standards. The chart, Figure 2, used on a recording potentiometer will serve as a permanent H ion concentration record of the water as delivered to the mains.

Cost Data

The cost of lime treatment to maintain a pH value of 7.9 in this water is as follows:

For the year 1932, $0.14 per million gallons, or $5,149.69
For average 1922-31, $0.21 per million gallons, or $8,630.82 per year

About 1,485 miles of cast iron pipe is owned by the city of Baltimore, with 197,268 house connections. It is unwise to evaluate the added life of pipe, provided by cor-

TABLE 1

ANALYTICAL DATA FROM OFFICE BUILDINGS
MONTHLY AVERAGE OF WEEKLY SAMPLES

Month	pH Inlet	pH Outlet	Ppm Iron Inlet	Ppm Iron Outlet	Oxygen — cc./liter Inlet	Oxygen — cc./liter Outlet
BUILDING "A"						
1932						
March	7.6	7.6	0.02	0.02	...	...
April	7.7	7.6	0.03	0.02	7.3	6.6
May	7.7	7.7	0.02	0.04	6.0	6.0
June	7.4	7.5	0.03	0.03	5.1	5.2
July	7.3	7.3	0.02	0.03	4.2	4.8
August	7.6	7.6	0.02	0.04	3.6	4.4
September	7.7	7.7	0.02	0.05	4.1	4.8
October	7.9	7.8	0.07	0.07	4.2	5.0
November	7.9	7.8	0.04	0.05	5.7	6.2
December	8.3*	8.2	0.02	0.02	7.4	7.2
1933						
January	7.8	7.7	0.01	0.02	7.7	7.1
Average	7.7	7.7	0.03	0.03	5.5	5.8
BUILDING "B"						
1932						
March	7.5	7.4	0.03	0.03	...	...
April	7.6	7.6	0.03	0.04	7.0	5.8
May	7.6	7.5	0.03	0.04	6.2	5.5
June	7.4	7.4	0.03	0.04	5.2	4.8
July	7.3	7.3	0.02	0.02	4.5	4.1
August	7.6	7.6	0.03	0.03	3.8	3.7
September	7.5	7.5	0.03	0.02	4.3	3.8
October	7.8	7.9	0.07	0.08	4.4	4.0
November	7.8	7.8	0.03	0.04	5.8	5.6
December	7.9	7.8	0.02	0.02	7.2	6.8
1933						
January	7.8	7.7	0.03	0.03	7.6	7.4
Average	7.6	7.6	0.03	0.04	5.6	5.2

*Iron and lime coagulation at pH 9.0.

TABLE 2

pH OF TAP SAMPLES FROM VARIOUS SERVICES
MONTHLY AVERAGE OF SEMI-WEEKLY SAMPLES

Year	Month	Plant*	Low	Middle	High
1931	May	7.8	8.0	7.9	7.9
	June	7.7	7.8	7.9	7.7
	July	7.6	7.8	7.9	7.9
	August	7.6	7.9	7.8	7.7
	September	7.3	7.4	7.4	7.4
	October	8.4	8.2	8.3	8.0
	November	8.8	8.4	8.4	8.4
	December	8.0	8.2	8.2	8.3
1932	January	7.9	7.8	7.8	7.8
	February	7.5	7.5	7.5	7.5
	March	7.8	7.7	7.7	7.7
	April	7.6	7.8	7.9	7.8
	May	7.7	7.8	7.8	7.8
	June	7.5	7.6	7.7	7.8
	July	7.4	7.6	7.6	7.5
	August	7.6	7.7	7.8	7.7
	September	7.6	7.6	7.8	7.8
	October	7.6	7.7	7.6	7.6
	November	8.3	8.0	7.7	7.7
	December	7.9	7.8	7.7	7.7
1933	January	7.8	7.8	7.7	7.7
	Average	7.8	7.8	7.8	7.8

*Average of samples collected every 2 hours.

TABLE 3

GENERAL OPERATING AND MAINTENANCE EXPENSE

Year	Miles of Pipe	Cost	Cost per Mile
1920	883.5	$1,859,000	$21.04
1927	1295.9	1,845,455	14.24
1928	1321.4	1,850,664	14.00
1929	1365.8	1,824,359	13.36
1930	1426.3	1,841,313	12.91
1931	1465.6	1,851,384	12.63

TABLE 4

INCREASE IN HARDNESS CAUSED BY LIME TREATMENT

	Average 1922 to 1931	1932
G. P. G. lime applied	0.39	0.29
Calculated as ppm $CaCO_3$	12	9
Alkalinity, ppm $CaCO_3$	5	3
Soap hardness as $CaCO_3$	11	9
Calcium (Ca)	4.0	3.3
Total hardness calculated from Ca determination	10	8

rective treatment, over a span of years. There are many variables to be considered, external electrolysis being the most common. Table 3 indicates that a substantial decrease in depreciation and maintenance charges has been observed in the last few years. It shows that 582 miles of mains have been installed since 1920, an increase of 66 per cent, with a decrease in operating cost of 40 per cent, or $8.41 per mile. Based upon the 1932 mileage, this is a saving of approximately $12,500. The lime treatment for that year cost $5,150, giving a net direct saving of $7,350 to the city. Other factors, however, enter into this cost reduction. External electrolysis has been eliminated; pitometer surveys have reduced old leaks, and a higher degree of maintenance has been instituted in relation to repairs. Obviously, the lime treatment cannot be credited with the entire saving during this period of years, but it is a most important factor.

The increase in total hardness of the water caused by lime treatment is given in Table 4. It is interesting to note the close agreement between the analytical results and those obtained by direct computation from the amount actually applied. Information compiled from several investigations by Buswell has determined that in laundry practice 0.1-pound of soap per ppm of hardness per 1,000 gallons of water is wasted in softening. In 1932 there was an increase of 9 ppm average hardness, and from 1922 to 1931 of 12 ppm. Utilizing Buswell's data, it is evident that about 900 pounds of soap per million gallons was necessary in 1932, and 1,200 pounds from 1922 to 1931 to soften the water actually used for laundry or other washing purposes.

Laundry soaps cost about 5 cents per pound, and the ultra-fine toilet brands 80 cents, making it impossible to evaluate this soap consumption in terms of consumer cost, even if the volume of water so used were known. It is not practical to estimate this quantity, for no exact proportion of the total pumpage so used can be determined, causing the assumption of any financial value to be questionable. The average industrial plant can easily evaluate the increased hardness in relation to its own steam-producing costs.

Apart from the actual saving in pipe maintenance costs to the city, other factors are important: repairs made by consumers to pipe lines are reduced; water loss and property damage from leaks caused by corrosion are eliminated; staining of clothes and household fixtures does not occur; and assurance of a continued carrying capacity of the mains free of stoppage by rust with the passage of time is given, thereby decreasing investment cost. The total saving to the community is very great and does not compare in any degree to the slight added cost entailed by the increased hardness.

Acknowledgment is made of the interest and cooperation of George B. McCall, Junior Chemist, who conducted the necessary laboratory investigations. The assistance of James W. Armstrong, Filtration Engineer, J. S. Strohmeyer, Distribution Engineer, and Leon Small, Water Engineer, in furnishing and releasing certain data is appreciated.

A Free-Time Activities Council Urged for Every Community

"Three years ago it became apparent to the Mayor's Committee on Unemployment that there are two phases of relief—material relief, dealing with the bare subsistence of the individual, and that touching his mental, moral and spiritual necessities. The individual's bare subsistence is basically a matter of relentless mathematics and dietetics. On the other hand, the question of feeding his mind, bolstering his morale, developing his faith in the future, is restricted only by the amount of effort those aware of this side of the subject are willing to put into it. In this connection they can be spendthrifts.

"At the end of three years, recognition of the fact that relief is a double-barreled weapon is even more vital. What shall be done with the leisure time of those receiving relief—and now, even those working under a code restricting hours? Never in this country has the need for rational educational and recreational programs been so apparent. What does it profit to keep a man alive if in all other respects he is dead? These two forms of relief are so closely bound together that neither one can stand alone.

"Every community in the country should have a free-time activities council of experts in the art of playing."

—The foregoing statement, by one of Buffalo's leading citizens, Daniel W. Streeter, was read by Samuel B. Botsford, Executive Vice-President of the Buffalo Chamber of Commerce, at the NACOS convention in New York, on September 27, 1933.

Method of Crossing a Tidal Stream with a Water Main

By **WILLIAM J. LUMBERT**
Superintendent, Water Department, Scituate, Mass.

WHEN the town of Scituate, Mass., bought the Humarock Beach Water Co. property at Humarock Beach, Mass., it became necessary to lay a 10-inch water main across the South River for fire protection. A careful study and investigation of various methods was made by the town's consulting engineers, Metcalf & Eddy, of Boston, Mass., and it was decided to use Transite pressure pipe for the crossing.

Transite pressure pipe is composed of asbestos fiber and portland cement combined under pressure into a dense homogeneous structure with high strength and unusual resistance to destructive agencies. It has been in use in Italy for nearly twenty years, and in other countries for a less number of years. As it was necessary to lay the entire crossing in salt marsh mud or soil, the question of soil corrosion and tuberculation were most important, and led to the selection of this type of pipe.

Both the top soil and the bottom soil at South River are sand-clay mixtures containing considerable amounts of organic matter. The top soil contains a smaller percentage of sand than the bottom soil, but a considerably higher percentage of organic matter, mostly partially decomposed plants. Each of the soils contains a relatively high percentage of water-soluble matter, the top soil containing about twice as much as the bottom soil. The principal salts present are sodium chloride and sodium sulphate, although the fact that acid radicals, chiefly chloride and sulphate, are in excess, indicates the presence of acid salts. The pH values of these soils are low, indicating strongly acid conditions. It is probable that organic acids derived from the decomposition of vegetable matter are also present; in fact, the decaying of vegetation is considered to be the ultimate cause of the acidity of these soils. The presence of high percentages of soluble salts causes the electrical resistance of the soils to be very low.

The total acidity of the soils was not determined, but the presence of so much organic matter indicates that it is high. Therefore, the soils should be able to maintain the low pH values for a long time. This analysis shows that a very definite corrosive action would start immediately on any metal exposed to its attack. Many tests and continued use of Transite pipe have shown that it is not attacked by corrosion from water on the inside or from salt water or mud on the outside. In any event the galvanic action prominent in the corrosion of metals, and generally responsible for pitting, would be entirely absent in this type of non-metallic pipe.

Joints

A special study was made of the joints to be used for this work, and a flange was designed capable of withstanding any reasonable lateral strain that might occur in placing the pipe. The flanges were pulled on over a rubber ring, to make a tight joint, and were bolted together with twelve 7/8-inch diameter galvanized bolts. A service gasket was placed between the flanges, and the bolts were set up tight. Each length of pipe with its flange was tested to a pressure of 250 to 300 pounds per square inch on the ground before placing, and all the bolts and nuts were dipped in hot asphalt.

Method of Laying

That portion of the line beneath low water was required to be laid in a trench not less than 3 feet deep, and to accomplish this, a cradle was built on shore and nearly in line with the trench. Twenty-three lengths of Transite pipe were bolted together and secured firmly to the cradle. Blank flanges were then placed on the ends of the section, and a pressure of 40 pounds per square inch was applied. The pressure was developed to test the joints and to extend the pipe to a position so that the ends would not be in contact, and also to leave the pipe and the joints free to assume a normal, safe position in the river bed.

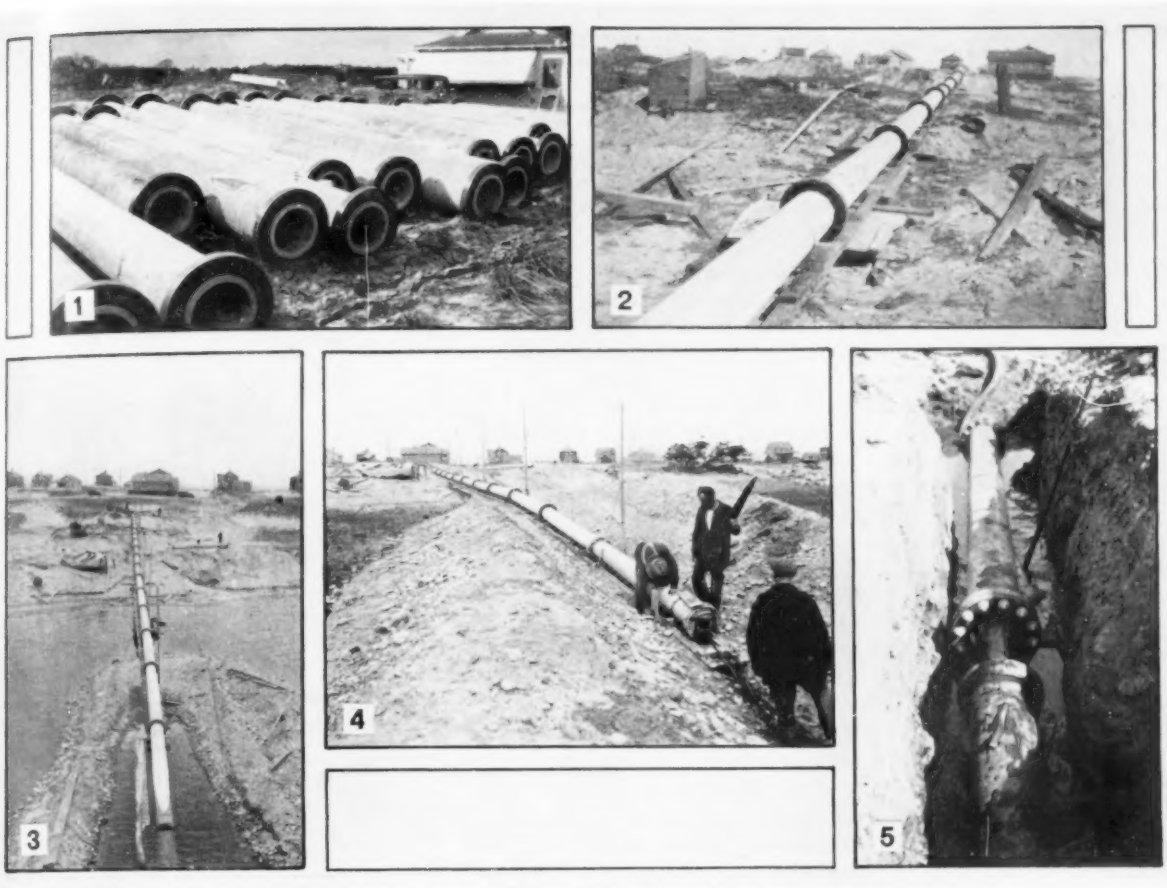
As soon as the trench was completed, the entire assembly was pulled into the trench. Tackle was arranged at the end of the cradle so that one-third of the pull was applied to the back end of the pipe by a cable passed through the pipe, and two-thirds of the pull was applied to the cradle. Rafts were placed over the pulling cable to prevent damage to the pipe by the snapping action of the cable due to stopping and starting the hoist motor. The assembly was pulled very slowly and carefully, and the placement was accomplished easily. The total weight of the assembly was about 6 tons. Water was allowed to fill the pipe as it entered the river, to prevent flotation.

Immediately after the pipe was placed in the trench and checked for line and grade, a pressure of 40 pounds per square inch was applied to test the joints for leakage, and, much to the credit of this type of construction, no leakage was detected. Blocks of concrete, precast to fit the pipe and weighing about 250 pounds, were placed near the joints as soon as possible, and loading with the concrete was continued until there were fourteen blocks on each pipe, seven at each end.

Pipe-Laying Above Low Water

At each end of the section under low water, the line was continued by laying one length at a time in a trench not less than 4 feet deep. Concrete loading was not used outside the low-water lines, the trench and backfill being deemed sufficient to hold the pipe in place under a pressure of 110 pounds per square inch.

Each section of the pipe is approximately 13 feet long, 10 inches inside diameter, and 12.04 inches outside diameter, and weighs approximately 415 pounds without the flanges. The transition from Transite pipe to cast iron



CONNECTING UP AND MOVING THE NEW TRANSITE PIPE LINE INTO PLACE IN SOUTH RIVER, SCITUATE, MASS.

1. The flanged pipe in the yard at the site of the work. 2. The pipe set up on the cradle. 3. A view from the top of the A-frame, showing the pipe assembled on skids and the wooden indicator masts erected at every length. 4. The twenty-three lengths assembled and tested just before being pulled across the river. 5. The "dutchman" connecting the flanged Transite pipe to the bell-and-spigot cast iron pipe

pipe was made by using a cast iron "Dutchman" flanged to fit the Transite pipe on one end and having a standard cast iron bell-and-spigot joint on the other.

Backfilling the trench was done by a dragline bucket pulled to but not across the trench, but where a scouring tidal action occurred, the trench was filled with sand bags placed by hand.

After the entire section of Transite pipe was in place and properly backfilled, it was flushed thoroughly and then tested with water under a pressure of 100 pounds per square inch over two periods of 30 minutes each. The total leakage on 506 feet of the Transite pipe with six Mineralead joints, one Ross regulator valve and one 10-inch Hersey Detector meter connected, was 0.282-gallon in 30 minutes. This is a remarkable record for leakage on a submarine water main.

Fire-flow tests have been made, using pumps and quick-closing nozzles, and there is every reason to feel that the installation is satisfactory from every angle.

The Alternative to the Dole

DISCUSSING the problem of unemployment from a long-range point of view, in his presidential address at the annual convention of the International City Manager's Association, in Chicago, September 18, C. A. Dykstra, City Manager of Cincinnati, emphasized the fact that automatic machinery is still being built; that the intermediary services of the middleman and entrepreneur are being cut down; that the number of financial and business units grows less under our eyes; and that mass production is still our method of manufacture.

"Meanwhile," said Mr. Dykstra, "the younger generation fresh from school roams the streets looking for something to do. Are we finding the answer to this problem? Can our schools find it for us? As we think this question through, there seems but one possible answer. The service industries and occupations offer the only fields for absorption of workers until the day comes when our population is declining instead of growing.

"There are still many things that need to be done for society, things disassociated from the fields of manufacture and commerce. Housing, sanitation, and public health, together with a wealth of individual services, need infinitely more attention than they have ever had. The manifold services still to be performed must furnish jobs or positions and wages for those coming to manhood and for those who no longer find employment in the older industries. Surpluses available because of automatic machinery and savings due to coordination and reorganization will be used to provide the financing of these services.

"This is the way to the necessary spread of purchasing power which our economic system must have if it is to survive. . . . The alternative is the dole."

Storm-Sewer Assessments

A Method That Has Stood the Test of Use

By **FRANKLIN HUDSON, Assoc. M. Am. Soc. C. E.**
Hudson and Davis, Consulting Engineers, Elizabeth, N. J.

IT IS to be hoped that a New Deal in storm-sewer assessment practice will soon take place throughout the country along with the other vital changes which are now occurring. No doubt many assessment commissions and engineers have puzzled over the oft-repeated perplexing statement in assessment literature, that "equitable assessments were distributed in accordance with the benefits derived," and wondered just what was really meant as they worked out their own particular problem.

A glance at the results of an extensive survey of assessment practice covering the territory shown on the map should convince anyone that "Equity is a roguish thing" indeed, as quoted by "Ephraim Tutt" in a recent issue of the *Saturday Evening Post*. As a matter of fact, only a small percentage of the municipalities indicated in the survey can be said to agree on any equitable method of assessing, while a considerable majority are content to let the city at large pay the bill regardless of special benefits.

The table on page 57 is a complete record of the answers to six questions pertaining to assessing for storm-sewer benefits. These questions were decided upon after careful study of many individual assessment problems and extensive experience in distributing assessments for public works. The one all-important point of "a property owner's just complaint" was constantly kept in mind. These questions are:

No. 1. What percentage of the total cost of a main storm sewer is charged to the city at large?

No. 2. What percentage of the total cost of the sewer is charged to property within the drainage area?

No. 3. What nominal sum is assessed as a service or tapping charge against a 50-foot frontage abutting the new sewer?

No. 4. Are additional assessments levied against special areas which are relieved from flood overflows of the natural stream?

No. 5. Are property owners assessed for the value of land subject to reclamation by filling-in the stream channel on their properties after construction of new storm sewers in adjacent streets?

No. 6. Are credits allowed for existing temporary culverts, and stream improvements (later replaced by new sewer) built by private owners across their property.

"Remarks" Are Instructive

The information contained in the "Remarks" in the table is of extreme value in showing that many of the municipalities are either following long-established precedent regardless of the possibilities of more equitable methods of assessment, or are interpreting the previously mentioned perplexing statement in existing laws along the lines of least resistance. These remarks also contain much valuable information on the distribution of sanitary and combined sewer assessments.

Summarizing the results of the survey in a general way, it was possible to tabulate the answers as follows:

PORTION OF THE UNITED STATES COVERED BY THE STORM SEWER ASSESSMENT SURVEY

ANSWERS TO QUESTION No. 1:

Percentage of Cost Paid by City at Large	Number of Municipalities	Percentage of Municipalities
100%	28	65%
100% for sewers over 36" in diameter	1	2.3
100% trunk 0% laterals	1	2.3
100% less $1.25 per front foot and 2c per sq. ft.	1	2.3
80%	1	2.3
50% except for large trunk sewers and then 100%	1	2.3
25%	2	4.6
2% plus cost of street intersection	1	2.3
0%	7	16.3

ANSWERS TO QUESTION No. 2:

Percentage of Cost to Drainage Area		
100%	6	14%
100% legally—customary 6⅔%	1	2.3
100% laterals—0% trunk sewers	1	2.3
98% less cost street intersection	1	2.3
100% for less than 36" pipe	1	2.3
75%	2	4.6
About 20%	1	2.3
16%	1	2.3
¼ to abutting property on each side of street	1	2.3
0%	28	65%

ANSWERS TO QUESTION No. 3:

Service and Tapping Charge to 50-ft. Lot		
$0.00	28	65%
1.00	1	2.3
1.25 plus 2c per sq. ft.	1	2.3
2.00	2	4.6
3.00	2	4.6
5.00	1	2.3
7.00	1	2.3
15.00	1	2.3
37.50	1	2.3
7.50 permit plus $50.00 to $75.00	1	2.3
50.00 trunk 1.00 lateral	1	2.3
62.50	1	2.3
½ cost of nominal sized pipe	1	2.3
100.00	1	2.3

Question No. 4: Yes—7 No—36

Question No. 5: Yes—3 No—40

Question No. 6: Yes—3 No—40

STORM SEWER ASSESSMENT DATA TABLE

State and City	Population 1930	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Alabama							
Birmingham	259,678	0	[1]	0	[2]	No	No
Mobile [2]	68,202	0	100%	0	No	No	No
Connecticut							
New Haven [6]	162,655	100%	0	0 [4]	No	No [5]	No
Stamford	46,346	100%	0	0 [7]	No	No	No
Delaware							
Wilmington	106,597	....	[8]	....	No	No	No
Georgia							
Macon	58,829	100%	0	0	No	No	No
Savannah	85,024	100%	0	$1.00	[9]	[9]	No
Illinois							
Oak Park	63,982	0	100%	$7.00	[10]	[11]	[12]
Indiana							
Hammond	64,560	0	100%	0	No	No	No
Elkhart [13]	32,949	0	100%	[14]	[15]	[16]	[16]
Iowa							
Sioux City [17]	79,183	80%+	20%+	$5.00	Yes	Yes	No
Kansas							
Topeka [19]	64,120	100%	0	0	[18]	[18]	[18]
Wichita	111,110	0	100%	$3.00	[20]	No	No
Salina	20,155	100%	0	0	No	No	No
Kentucky							
Covington [21]	65,252	100%	....	....	....	....	....
Ashland	29,074	100%	0	0	No	No	No
Maine							
Portland	70,810	100%	0	[22]	No	No	No
Lewiston [23]	34,948	100%	....	....	....	....	....
Maryland							
Hagerstown	30,861	0	0	0	No [24]	No [24]	No [24]
Cumberland	37,747	100%	0	$15.00	[25]	No	No
Massachusetts							
Brookline	.....	100%	0	0	No	No	No
Fall River	115,274	100%	0	0	No	No	No

State and City	Population 1930	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Michigan							
Ann Arbor [27]	26,944	100%	0	0	Mo	[26]	No
Highland Park [28]	52,959	100%	0	[29]	No	[30]	No
Dearborn [31]	50,358	[32]	[33]	[34]	No	No	No
Missouri							
St. Joseph	80,935	100%	0	0	No	No	No
Jefferson City [35]	21,596	....	....	....	....	....	....
New Jersey							
Atlantic City	66,198	100%	0	0	No	No	No
Montclair	42,017	25%+	75%+	0	No	No	No
Passaic	62,959	100%	0	0	No	No	No
Trenton	123,356	100%	0	0	No	No	No
Bloomfield	38,077	[36]	[37]	....	Yes	Yes	No
New York							
Jamestown	45,155	100%	0	0	No	No	[38]
Mount Vernon	61,499	100%	0	0	No	No	No
Ohio							
Hamilton	52,176	100%	[39]	0	No	No	No
Zanesville	36,440	[40]	[41]	[42]	No	No	No
Oklahoma							
Tulsa	141,258	100%	[43]	[44]	No	No	[45]
Pennsylvania							
Lancaster	59,949	100%	0	$62.50	[46]	....	....
McKeesport	54,632	100%	0	0	No	[47]	....
Allentown	92,563	100%	0	0	No	No	No
Rhode Island							
Central Falls	25,898	All	16%	$37.50	No	No	No
Tennessee							
Knoxville	105,802	25%	75%	0	No	No	No
Vermont							
Burlington	24,789	[48]	[49]	$2.00	No	No	[50]
Virginia							
Roanoke [51]	69,206	100%	0	0	No	No	No

REMARKS:

1. Legally 100%; customary 66⅔%, discretionary with commission.
2. Yes, but collections so far not successful. We interpret state law to permit, but assessments have been contested.
3. Storm sewers are constructed at same time as paving and total cost assessed to property holders. A few large drains have been paid for by city at large.
4. $3.00 for excavation.
5. The city does not drain private land.
6. Only sanitary sewers are assessable against abutting properties. The rate is $1.75 per front foot.
7. ½ cost assessed against abutting owners on sanitary sewers only.
8. Only one assessment made against abutting owners regardless of sewer size. Assessment of $1.25 per front foot plus two cents per square foot area of lot.
9. This condition does not exist.
10. Additional assessments are levied where benefits are special compared to the general benefit to the average property in the district.
11. No additional assessment has been levied for this purpose, the land in most cases being a benefit to the municipality, as a dump for ashes and excavation materials.
12. No, except where the improvements privately made are of such nature that they harmonize with plan of new improvement.
13. Sewer system nearly 100% combined sewers.
14. Laterals are laid to curb at time of installation. The entire cost assessed by area. Assessment $2.00 per front foot.
15. No such condition exists here.
16. No such case has arisen.
17. City at large pays for ordinary storm sewers.
18. Assessments never spread which were levied by reason of natural stream improvement.
19. Statutes provide for storm and sanitary sewers to be paid for by benefit district and assessment spread on valuation basis. Property to be appraised by three appraisers appointed by city. City Storm sewers have been built at expense of city at large. Other statutes require city to care for storm water, thus creating conflict in laws.
20. Such work is charged to city at large except that special benefits may be assessed to overflow area and balance paid by city at large.
21. Combined sewer system. Trunk lines paid for by city and connecting sewer assessed against abutting property up to $2.00 per foot.
22. Public sewer, storm or sanitary, laid in public street assessed to abutting land and land benefited thereby up to ⅔ the cost of the sewer. In case of a main sewer servicing more than one street, assessment to abutting property based on size necessary for single street.
23. Combined sewer system. No sewer tax. Fee for connection is $5.00, established 60 years ago and never changed.
24. Storm sewers built by direct taxation but benefits and damages may be assessed any or all property owners at discretion of Board of Street Commissioners.
25. Flood prevention 100%.
26. Do not have such conditions.
27. Provisions in charter for assessing storm sewers but cost was borne by city at large for first sewer and this practice has continued.
28. Combined sewer system except pavement drainage, which is assessed with paving.
29. 100% for lateral sewers.
30. No reclaimed land.
31. Combined sewer system.
32. 0% laterals, 100% trunk sewers.
33. 100% laterals, 0% trunk sewers.
34. $1.00 laterals, $50.00 trunk sewers.
35. No main storm sewers, city pays 100% of main sanitary sewers and district sewers assessed 100% against property.
36. Usually none.
37. All, but if town shares in cost, 60%—40%.
38. Former practice when building culverts across property was to assess ½ cost to owners according to lineal feet on property with city paying balance. Collections very difficult so city now pays full cost.
39. Only charge to property is for small laterals in connection with paving where specially petitioned and property agrees to pay entire cost.
40. 2% plus cost of street intersections.
41. 98% less cost of street intersections.
42. Assessment based on figured rate per acre, no tapping charge.
43. Main sewers are usually considered 36" or larger and paid from bond issue funds voted by and assessed against city as a whole. Smaller sewers may be paid for from these funds to complete a project. Practically all sewers less than 36" are paid for by property in the paving district in which they are constructed on a square foot basis. (Oklahoma Paving Law 1923, each quarter block—shall also pay the proportionate cost for construction—drainage pipes, sewers and sewer connections in proportion to the cost of the entire area of the improvement drained, and the board of appraisers shall determine the amount of benefits to each quarter block—Author). Oklahoma State Laws permit formation of drainage district but this variance from regular procedure was unpopular in Tulsa.
44. $2.00 permit fee for either storm or sanitary for each connection.
45. Yes, provided sewer is of standard design and supervised by city, otherwise, no.
46. Do not have this condition.
47. Have had no work of this nature.
48. ½ except in case of large trunk lines and then city at large pays all.
49. ¼ to abutting property on each side of street.
50. Yes, allowed in some cases many years ago.
51. Assessments for sanitary sewers are ⅓ of total cost based on front footage served on each separate contract.

What Value Have These Data?

At this point the question may well be asked: Is there any value in the above information? The answer can very well be "No" if present-day methods of assessing are allowed to continue, but if it is conceded that special benefits such as individual service, flood relief and land reclamation, as covered by Questions No. 3, 4, 5, and 6, are part of any rational distribution of benefits, the answer is emphatically "Yes." Possibly the greatest immediate value will then be found as an intangible which will consist of serious thought and discussion here and there concerning the need and possibilities of more scientific methods of assessing.

An Outstanding Example

As an illustration of the manner in which a rational assessment list can be determined, the case of Roselle, N. J., might be cited. Property owners in this municipality recently demanded the solution of a storm-sewer assessment problem which has caused bitter controversy for over three years. The storm sewers in question were a 48-inch sewer approximately one mile long in the easterly section of the town, and a 66-inch sewer about 3,400 feet

long serving the people in the western section, together with shorter 36-inch drains and various laterals. The Borough Council decided to have a complete engineering study made, in the hope that the matter could be finally settled.

The firm of Hudson and Davis, consulting engineers, of Elizabeth, N. J., was retained to make an analysis of the problem and recommend individual assessments.

The engineers found at the start of their investigation that several of the storm sewers appeared to be too small. This necessitated a complete hydraulic study of the whole system, together with the compilation of rainfall and run-off statistics. Actual run-off measurements were made during two severe storms, which were of value in applying the rational method of storm sewer design. Stream-flow conditions prior to the construction of the sewers were determined, as well as the capacities of the new storm drains. The results of the investigation proved that three distinct special benefits existed, namely, flood relief, land reclamation and a service or tapping benefit. Ordinarily, an additional special benefit to property within the drainage area could be rationally justified, but in this particular case, owing to the lack of planning and inadequacy of the system, such benefit did not exist.

Flood relief as a benefit was determined directly from the hydraulic investigation by a comparison of the rating curves showing flow in the natural streams prior to the sewers with the capacities of the new drains. It was possible to show just how much the flood levels would be affected by the new construction.

Translating such benefits into dollars and cents was made possible by predicating this important step on a legal decision which stated in part—"the fair cost of an improvement which reasonable owners would make at their own expense, might, I think be a just criterion for determining the benefits received" (*State, Hunt, Pros. v. Rahway*, 39 N. J. L. 646 affirmed 40 N. J. L. 615).

The logical improvement that an individual owner would make would consist of a fill to raise his land above flood height, and this was the basis of the evaluation of flood benefits. A hypothetical fill of sufficient height to prevent the natural stream from overflowing at flood flows equal in magnitude to the capacity of the sewer was calculated and costs for such fill were based on average prices for embankment which prevailed at the time the sewers were constructed. A "cost-depth factor" was developed for various depths of fill to facilitate distribution of benefits to the lots and parcels of ground affected.

Land reclamation, as the second special benefit named, was described as the value of land between the banks of a natural stream which had been made available to the property owner by the construction of the new sewers. The value of this land is equal to the minimum value of property located immediately on either side, less the cost of filling to grade. After determining a front-foot minimum property value for such reclaimed land, a location factor was added to provide for any position of the stream with respect to the front of the lot. This factor divided any parcel of ground into sections of various relative values.

The service or tapping benefit which is correctly chargeable to property abutting a storm sewer was defined as the value of the provision for drainage that a property owner would have to make in order to obtain surface and front street drainage benefits equal to those afforded by a storm sewer abutting the property. This benefit would ordinarily be obtained by the minimum practical sized drainage pipe, namely 12 or 15 inches in diameter parallel to the front of the property. As one such line would adequately serve properties on both sides of a street, the enhancement of property could not exceed one-half of the fair cost of such pipe having a length equal to the frontage of the lot. Benefits were based on actual value to property owners rather than on cost as indicated by specific unit prices for the contract work. An average cost for 12- and 15-inch storm-sewer laterals, using twenty unit prices from as many localities, determined the value to the property owner.

The report submitted by the engineers was received by the Council, and after necessary public hearings the complete list of recommended assessments was adopted and levied against the property benefited. Interested citizens, who for over three years had bitterly fought the many arbitrary attempts at assessment distribution, stood solidly behind the engineers' assessment list, and the local newspaper in reporting on the public hearing headed its story, "Storm Sewer Meeting Not So Stormy."

Storm-sewer assessments and equity are as a general rule quite difficult to equate. It is believed, however, that any assessment problem may be rationally solved and that a careful survey and study by a disinterested consulting engineer is fully justified in time and expense.

30 Per Cent PWA Grants to Cities Which Finance Their Own Public Works

OF the allotments of funds to municipalities during September by the PWA (the Federal Emergency Administration of Public Works), forty or more were for outright gifts of 30 per cent of the cost of labor and materials only, without loans. In announcing some of these grants, the PWA statement said:

"Noteworthy was a growing tendency of non-Federal public bodies to avail themselves of the opportunity to get a grant of 30 per cent of the cost of labor and materials for their local public works, while financing the balance of the cost from their own revenues without borrowing from Public Works Administration.

"PWA encourages local governments to seek grants alone because such action results in creating a greatly increased amount of employment in proportion to the PWA dollars allotted. Where a grant alone is made without loan, approximately $100 worth of employment, with all employment's regenerative benefits, is created by a $30 Federal investment.

"Where grants alone are made, PWA can move faster in making the simple contract required, because no examination of securities is needed."

Snow-Removal Experiences in American Municipalities

ALTHOUGH snowfalls in North America were rather slight in the winter of 1932-33 *in most sections, there were some places where winter returned to "the old days." One of the articles in the* 1933 *Municipal Index describes with considerable detail the snow-removal organization of District* 7 *of the State Department of Public Works of Massachusetts, where under the leadership of H. C. Holden, District Engineer, fast snow-plows keep the roads open at all times. These truck-mounted plows are supplemented by a few large wing plows and V-type plows on trucks with four-wheel drive and one rotary plow. Recent reports from city engineering departments follow:*

Salt Lake City, Utah

HAROLD B. LEE
Commissioner of Streets and Public Improvements

During the winter of 1932-33, Salt Lake City was compelled by existing conditions to tackle the largest problem the city has had in the removal of snow and ice. At times during the winter there was an average depth of 17 inches of snow on the level, and on the outskirts as much as 2 feet. The temperature was 10 to 15 degrees below zero at various periods. Salt Lake City has a total length of 535 miles of streets, and owing to the extreme depth of snow it was necessary to combat the snow continuously over the entire distance of these streets.

AN ALLIS-CHALMERS WHEEL TRACTOR WITH A V PLOW CLEARING SIDEWALKS IN WAUWATOSA, WIS.

As the first snow was anticipated in the late fall, the Department of Streets and Public Improvements began overhauling the snow-fighting equipment, which consisted at that time of two Caterpillar Sixty tractors equipped with LaPlant-Choate snow-plows, and five Baker plows which were attached to 5-ton Packard trucks. In addition to this heavy equipment there are forty-five sidewalk plows distributed over the entire city.

If the snow begins to fall in the early evening, it is usually necessary to call out the snow equipment about 2 o'clock the following morning along with the sidewalk plows. Operations are begun from the center of the business district and from there are carried onto the main traveled streets in each direction. By the time the early morning traffic starts for work, the roads are cleared, and as rapidly as possible the cross streets are cleared and the snow banked on the sides. Salt Lake City has an abundance of mountain water, so there is no danger of causing a water famine by the generous use of water for flushing the streets after a heavy snowfall. The water is turned on at the head of the streets of the business section, and the banks of snow are slowly fed into the gutter and carried away into the storm sewer. This saves the enormous expense that would be incurred if all the snow was hauled from the business district. Within the city limits there are hot springs, and the water from these springs is used to flush the streets to remove the ice and snow that has not been removed by the snow-plows. With this combination it is possible to completely remove any snow that falls inside the business district.

In the latter part of last winter the city faced a serious problem due to ice ruts forming at intersections. The extremely low temperatures made the use of the usual machinery impractical, but by equipping the machinery with sharp grousers and by moving machines back and forth across the ice centers it was possible to break up the worst of them. In addition to this, several hundred unemployed men were used under the direction of the Make-Work Committee. These men were furnished with picks and shovels and placed at the dangerous intersections to chop out the ice by hand.

Following the heavy snows of last winter, the city was faced with the danger of floods as the snow began to melt. In the early spring, in preparation for this, all gutter and sewer intakes were opened, which minimized the flood conditions which might otherwise have resulted.

Snow Removal in Sheboygan, Wis.

ARTHUR L. BOLEY
City Engineer

The frequent removal of small amounts of snow during the snowfall cost less than removing large amounts of snow, somewhat packed by traffic, some time after the snow had ceased to fall. Sheboygan, by reason of doing a great deal of work by force account, has several trucks and tractors of various sizes. Many of these are equipped for snow fighting. To properly maintain about 100 miles of streets in the city the following equipment is used: one Caterpillar Sixty tractor with a Wausau V-plow capable of removing snow up to 8 feet in depth for a width of 14 feet, and supplied with additional blades for winging the removed snow for an additional distance of 5 feet to either

side. This plow was presented to the city of Sheboygan by the Association of Commerce for the city's cooperation in opening blocked rural highways a few years ago.

The equipment used in Sheboygan, except in extraordinary blizzards when the Wausau plow is used, consists of one V-plow clearing a space 8 feet wide and from two to six trucks equipped with blade plows each clearing a width of 7 feet with some necessary overlap. Removal is begun shortly after the snow starts falling and is continued until the snow is winged into the gutter. The snow is removed from the streets in the downtown area by hand loading on trucks and is hauled to the river or lake front.

The total cost of snow removal from January 1 to December 31, 1932, was $4,819.78. The cost for the early months of 1933 was $10,046.94, owing to the fact that on two occasions compacted snow was removed from downtown streets and on some secondary business streets as a highly uneconomical unemployment relief measure where a portion of the labor cost was refunded to the Poor Fund by the state of Wisconsin. The cost of immediate removal would have been at least 30 per cent less. The low cost of ordinary removal is due to the fact that an adequate number of trucks are used and that removal begins shortly after the snow starts to fall and continues until all the snow is removed.

Handling Ice and Snow in Spokane, Wash.

ALFRED D. BUTLER
City Engineer

The removal of ice and snow from the pavements of Spokane is handled either by plowing or by loading and hauling. In the residence sections the snow is plowed from the main thoroughfares onto the parking spaces between the sidewalk and curb. In the downtown sections the snow is hauled away to a dump. The loading is done either by a Barber-Greene snow loader, owned by the city, or by hand.

The problem of the removal of ice has been a very serious one. Salt has been used on the pavements to a considerable extent, which has resulted in a good deal of damage to the surface of the concrete pavements.

Rain Solved Last Winter's Problem in Dover, N. H.

WALTER S. WHEELER
City Engineer

Dover did not have any snow-removal problem in the winter of 1932-33 until January. Then there was only a small amount of snow, which was readily removed, until April 12, when there was considerable sleet and some wet snow. At 7 A.M. on April 13 there was over a foot of snow on the ground and it was still falling. The local newspapers reported a total depth of snowfall of 30 inches during April 13 and 14, with much damage done to trees by the overloading of their branches by the wet snow.

This storm was followed by much rain and fog, which removed most of the snow before April 18. On April 21 all of it had disappeared, except in places where it had been piled up in the shade away from the sun. In this particular storm very little was done by the city to remove the snow from the streets, for it just melted away, but for a few days traffic was considerably impeded by the snow. The State Highway Department had housed all its snow-removal equipment.

NRA Codes and Municipal Tax Rates

THAT industry and business throughout the United States, as a result of the NRA codes, will be more vitally concerned than ever before with the services and costs of local government, was pointed out by Robert A. Crosby, Executive Secretary of the Bridgeport Chamber of Commerce, at the annual meeting last month of the National Association of Commercial Organization Secretaries. Mr. Crosby said:

"I wonder if you realize just how much individual communities are going to be affected in competition with other cities due in no small measure to the advent of NRA. With the application of the Recovery Act to business and industry, we are likely to have a leveling-out in the cost of production, and many factors with which the individual manufacturer has had opportunity to play in the past will be eliminated. As I am largely obligated to Morris Edwards of the U. S. Chamber for his logical development of this thought, I am quoting directly from a letter which I recently received on this subject:

"'As we have learned in all the discussions over the Recovery Act, cost is made up of many factors which vary as between companies and as between industries. In a manufacturing business, generally speaking, the more important costs are raw materials, labor, transportation, distribution and a series of overhead items such as taxation, management, depreciation and obsolescence on plant and equipment, etc. A manufacturer's competitive position depends, obviously, not upon where he stands just with respect to a single item of cost, but where he stands with respect to the aggregate of all costs. . . . Virtually all of the factors of cost were under the direct control of managers. At least to a degree they could be altered at will. If one item of cost should get uncontrollably out of line, it was generally possible to make compensating adjustments in other items. That is, if taxes should go up sharply in one city, it would be possible for the manufacturers there to make arbitrary adjustments of wages and working hours to offset the competitive effects of the tax increase. The effect of the changes brought about by the Recovery Act is rather startling. Whole items of cost hitherto controlled largely by management are removed from such control, mostly wages and hours. Raw materials costs likewise will probably become much more uniform. *If a given city has been sharply out of line in point of taxes, or is contemplating a material tax increase, it no longer will be possible* [for the manufacturer] *to make a compensating adjustment in wages, hours and raw material costs.* . . . I think it follows logically that, important as taxes have been to manufacturing communities in the past, they are many times more important now if those same communities are to avoid loss of competitive position.'"

Discussing tax burdens in relation to municipal services, Mr. Crosby emphasized the great importance of eliminating waste and inefficiency wherever they exist; but he also pointed out that with the growth in governmental functions many activities which were formerly conducted as private enterprises have been taken over as government functions.

"On this phase of the situation," said the speaker, "I want to place special emphasis, because so many times similar figures are quoted as showing the extravagance of American cities. However, we must look behind these figures and determine as to whether the money raised through tax levies has been wisely spent. We only have to go back a few decades to the era of low taxes; to a time when we were content with dirt roads and a man kept those roads in front of his own property in repair at his own expense; to the time when in our educational system, kindergartens, manual training, domestic science, the arts and crafts, and free textbooks were unknown and where the cost of these cultural and educational activities was paid for by the individual. To these items can be added many of the present functions of our health department, municipal charity or welfare organization, our public recreational system, including parks and playgrounds.

"In other words, we have, almost unconsciously, been developing a socialistic state which is continually taking over private functions. In doing this, it is perfectly natural that the cost of government should increase, and the real determination is as to whether the exercise of these functions can be more economically performed by government or by private groups and individuals."

Finally, Mr. Crosby made a plea for intelligent research by chambers of commerce and friendly cooperation with city governments, to the end that needless burdens of public debt and taxation may be eliminated and that services essential to the general welfare and progress may be maintained and improved.

Welfare Labor Producing 285 Miles of Highway in Onondaga County

"Surface Stabilization" Makes Roads Able to Carry 4,000 Vehicles a Day

A PART OF THE LARGE CREW OF WELFARE LABOR PREPARING DRAINS AND DITCHES

THE road-building program of Onondaga County, New York, is an outstanding example of how local unemployment relief can be combined with road building in such a way as to provide relief to large groups of men, and high-grade roads of permanent benefit to the community, both at low cost. The program is employing the services of 6,000 men who would otherwise be dependent upon welfare and relief organizations. The extra cost of keeping this small army of men at work on the roads, over and above the cost of having them on the welfare list, is only ten dollars a month a man. In return for this slight extra expenditure the county is obtaining 285 miles of highways of a type that is arousing the enthusiastic approval of taxpayers and residents along their routes.

Methods and Results

Construction plans call for surface stabilization, providing a "soil concrete" surface for immediate use. Gravel is spread 20 feet wide and to a depth of 9 inches in the middle, 5 inches at the sides. The surface is treated to provide the proper proportions of gravel, sand and clay. Calcium chloride is then applied at the rate of 1½ pounds to the square yard. Traffic quickly consolidates the surface to form a smooth, hard, dustless highway, which is practically impervious to water and requires no blading except after heavy rains.

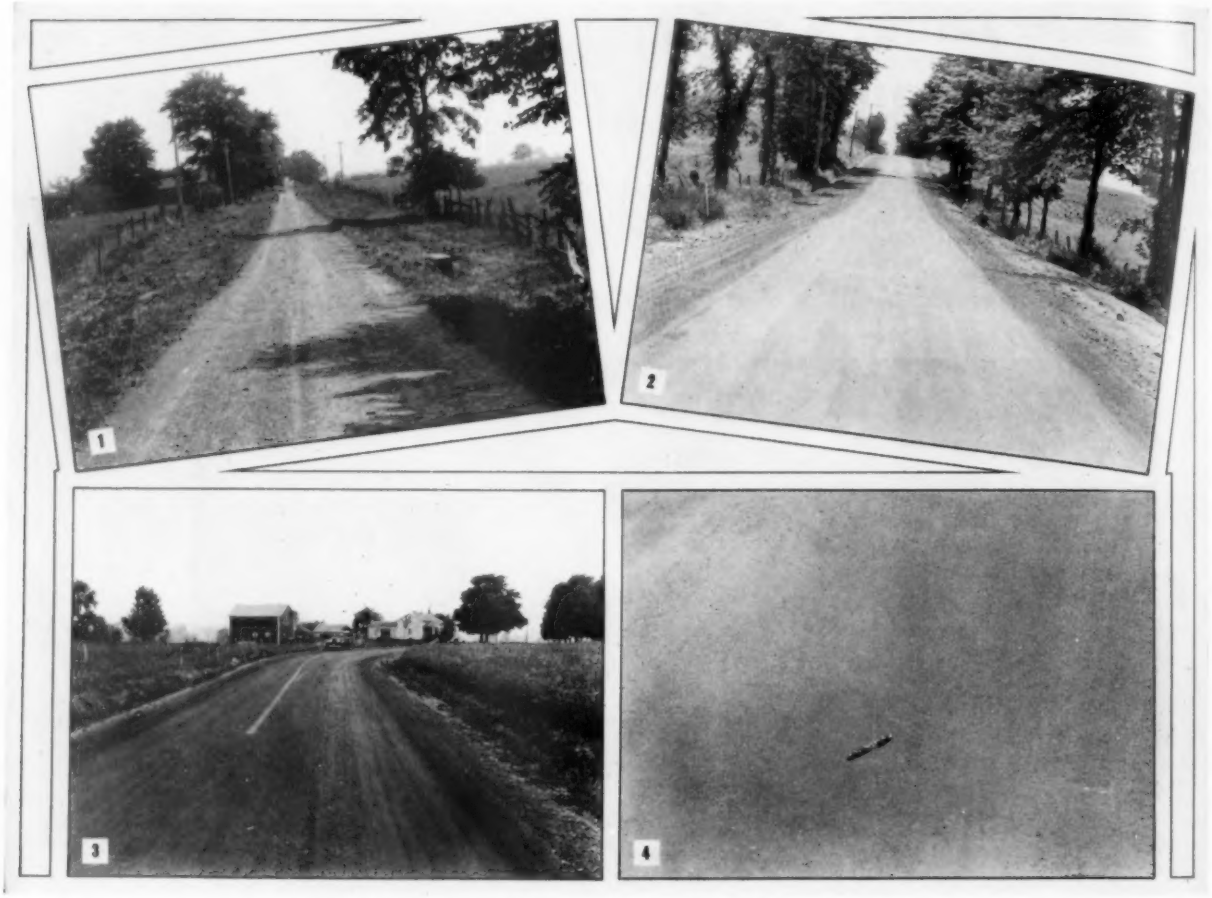
In embarking upon its program, the county's original plan was to lay the foundations for the later laying of an expensive type of pavement. A 50-mile experimental project was successfully completed last year. Now, with the mileage rapidly increasing, the county has discovered that instead of merely having the foundations, it has roads which will carry up to 3,000 to 4,000 vehicles a day, and carry them more economically than any other type of highway.

The surface is smooth, durable and hard—so hard that it is difficult to dig into even with a pickaxe. Although it has not been the usual practice to paint traffic markers on anything but concrete or asphalt surfaces, the degree of surface stabilization attained on the Onondaga roads has permitted the use of such markers.

Costs

As it has been possible to use local materials for surfacing, only 5 per cent of the money expended is going for materials. The whole of the remaining 95 per cent is going for labor. Further, as the money is all spent locally, it is finding its way back into the pockets of the very taxpayers who foot the construction costs. Farmers' teams are being called into paid service, and the farmers are getting roads which they would have had to wait many years for if the original, high-cost program had been carried out.

The major part of the mileage included in the program was recently inspected by a group from Washington including E. F. Kelly, Assistant Chief of the United States Bureau of Public Roads; B. C. Tiney, Chairman of the Maintenance Committee of the Highway Research Board; E. C. Lawton, Assistant Commissioner of the New York State Department of Highways in Charge of Construction;



THE RESULT OF BUILDING STABILIZED SOIL ROADS IN ONONDAGA COUNTY, N. Y.

1. A typical county road before improvement. 2. A similar road after improvement with gravel stabilized with calcium chloride. 3. Button Road, showing a traffic line painted on the treated gravel surface. 4. Close-up of a typical stabilized gravel surface

and Guy Pinck, Division Engineer of the New York State Highway Department. Literally scores of neighboring state, county and township officials have also inspected the work and studied the program.

Members of these various groups have expressed themselves as greatly impressed with the high-quality surfaces attained. Although the roads are built at approximately 15 per cent of the cost of highways built under previous programs, the delegations have found full-width roads, properly surveyed for alignment and grade, all culverts installed, and having a calcium-treated gravel surface, firmly packed, dust-free and capable of bearing thousands of vehicles a day.

Scarcely less impressive than the highways themselves is the type of relief labor employed. The men have shown a real "will to work," using picks and shovels instead of machinery to make the cuts and fills and prepare the grades for surfacing. Many of the men are of the "white collar" class, but in spite of the heavy physical labor involved—or perhaps because of it—they are in excellent physical condition.

The foreman of one of the gangs, a man of about fifty, was formerly a highly paid appraiser for a local bank. Another of the road workers was formerly the leader of a jazz orchestra. A large proportion of the men are young, and of the type which would normally have sought admission to the Conservation Corps camps. Because of the road-building project they have been able to remain at home and work in their own county.

While the low-cost road, unemployment relief program of Onondaga County is probably the premier example of the value of such programs for the entire country, similar highways have been developed in the East and Middle West. All of them together provide additional evidence of the manner in which the nation is entering upon a new era of low-cost road development that promises vast improvement of the farm-to-market and secondary road system.

City Planners and American Civic Association to Meet in Joint Conference

A CONFERENCE on Planning and National Recovery will be held at the Southern Hotel, Baltimore, October 9 to 11, under the joint auspices of the National Conference on City Planning and the American Civic Association. Subjects to be discussed will include Public Works Planning and Capital Budgets; Federal Grants for Plan Making; Planning Considerations in Various Kinds of Public Works; City and Regional Planning in Depression and Recovery; The Organization of the Planning Functions of the Federal Government; What Is National Planning?; The Organization and Administration of City and Regional Planning; The Social Cost of the Slum and What Can Be Done About It; The Technical Problems in Slum Clearance; The Planner's Viewpoint; Legislative and Administrative Problems of Slum Clearance.

Have We Actually a Housing Surplus?

MUCH opposition to Federal aid for housing and to local attempts to stimulate large-scale, low-cost home building has come from sources which allege that our American cities are actually suffering from a surplus and not a shortage of housing facilities. It ought to be possible in every city to meet these allegations with facts and not merely with surmises. Unfortunately, however, there are few cities in which recent comprehensive surveys have been made to disclose three cardinal facts: (1) the present number of vacancies in dwellings of different types; (2) the extent to which such vacancies have resulted from "doubling up" in other dwellings; and (3) the number of houses and apartments, whether occupied or vacant, which are really unfit for habitation.

In the absence of such detailed local studies, attention should be directed to two recent national surveys whose significance has been too generally overlooked. One of these, by the Bureau of Labor Statistics of the United States Department of Labor, was summarized on the page here reproduced

Extent of Housing Construction in Comparison with Increase in Number of Families

THE Bureau of Labor Statistics collects data concerning building permits issued in representative cities in the United States. One phase of this study deals with the number of family-dwelling units provided in new dwelling houses of all types. In making the Fifteenth Census of the United States, the Bureau of the Census collected information concerning the number of families living in dwelling houses of all kinds and the average number of persons per family. Data from these two sources are brought together in the following table to show the difference in the number of family-dwelling units provided in 279 cities as compared with the estimated increase in the number of families between January 1, 1930, and January 1, 1933.

EXTENT OF HOUSING CONSTRUCTION IN COMPARISON WITH INCREASE IN NUMBER OF FAMILIES IN THE 3 YEARS 1930 TO 1932, IN 279 CITIES HAVING A POPULATION OF 25,000 OR OVER, BY GEOGRAPHIC DIVISIONS

Geographic division	Number of cities	Total families April 1930 census	Median number persons per family, 1930 census	Population April 1930 census	Estimated increase, Jan. 1, 1930, to Dec. 31, 1932		Family dwelling units provided, 1930-32	Excess of families over dwelling units
					Population	Number families		
New England	38	840,612	3.50	3,531,940	106,880	30,537	14,993	15,544
Middle Atlantic	61	5,047,884	3.40	14,910,335	620,086	182,378	101,567	80,811
East North Central	75	3,015,712	3.25	12,046,748	775,937	238,750	33,228	205,522
West North Central	24	885,468	3.14	3,401,858	128,722	40,994	15,893	25,101
South Atlantic	26	758,667	3.34	3,083,575	128,167	38,373	17,353	21,020
South Central	29	973,397	3.16	3,846,807	280,256	88,689	25,267	63,422
Mountain and Pacific	26	1,289,778	2.88	4,503,935	395,687	137,391	48,999	88,392
Total	279	12,811,518	.....	45,325,198	2,435,735	757,112	257,300	499,812

According to the Census there were 12,811,518 families in April 1930 residing in the 279 cities covered by this study. Using Census figures and methods of estimating, it is estimated that the increase in population in these cities between January 1, 1930, and January 1, 1933, was 2,435,735. If it is assumed that the average number of persons per family was the same as on April 1, 1930, there was an increase in the number of families between these two dates of 757,112.

According to information obtained by the Bureau of Labor Statistics from these 279 cities, only 257,300 new family dwellings were provided during this period. Thus there were 499,812 fewer dwelling units provided than the increase in the number of families.

No information is available as to whether there was a surplus or a shortage of dwelling units on January 1, 1930, in these cities, so this apparent shortage in the number of family-dwelling units applies only to the increase in the number of families between the two periods. In other words, if on January 1, 1930, there was no surplus or no shortage in existing dwellings, there would be a shortage of 499,812 family-dwelling units on December 31, 1932. If there was a shortage on January 1, 1930, the shortage would be still greater than this number of dwelling units. If there was a surplus of dwelling units on January 1, 1930, this surplus would have to be subtracted from the 499,812.

from the *Monthly Labor Review* for July, 1933. As will be seen, the Bureau estimates that in the 279 cities studied the new dwelling units constructed during the years 1930-33 were nearly half a million *fewer* than the increase in the number of families during those three years. If account were also taken of the number of houses demolished during the same period, the failure of housing accommodations to keep pace with population growth would be even more marked.

The second study above mentioned is the 21st semi-annual survey of the real estate market, released July 23, 1933, by the National Association of Real Estate Boards. This showed the following percentages of cities in the United States and Canada reporting over-building, normal supply or shortage in single-family dwellings and apartments:

	Single-Family Dwellings	Apartments
Over-built	16 per cent	36 per cent
Normal supply	72 " "	59 " "
Shortage	12 " "	5 " "

In its release from which these figures are taken, the Association said:

"Many cities report that with any return to normal buying power they would have a dwelling shortage. Where oversupply exists, there is often at the same time an actual shortage of new, modern houses, the over-stock being heaviest in large, old houses."

During the months immediately ahead, many intelligent "white collar" workers will be receiving public relief. What better use could be made of their time than to have them undertake, under competent supervision, surveys which would make available the data essential to an intelligent appraisal of local housing needs?

Ohio Enacts a "Housing Authority" Law

ON September 5, through an emergency measure signed that day by Governor White, Ohio became the first state in the Union to enact legislation under which full advantage can be taken of the Federal loans and grants available to public bodies for slum clearance and low-cost housing projects. The principal features of this new Act are outlined as follows in Millar's Housing Letter of September 11:

"A Housing Authority is a public body, though without power to levy taxes, created by and reporting to the State Board of Housing. The five members are appointed, one by the county commissioners, one each by the probate and common pleas court, and two by the mayor of the largest city. Terms are staggered; eventually there will be one appointment a year, each for a five-year term. Accounts are subject to audit by the official state auditing agency. No local unit of government is to have any liability for debts incurred by the Authority. Being a public body, it can ask for a 30 per cent grant from the Federal Government, and a loan for the remainder.

"Plenty of power is delegated to the new agency. With the approval of the State Board of Housing, it may exercise the power of eminent domain. By paying to the common pleas court money to guarantee payment for property appropriated, it may proceed to take title at once, leaving the matter of final adjustment as to price to be threshed out later.

"An interesting provision is included in the Act for providing the initial financing. County commissioners of the county in which the Authority is located are authorized to make a loan up to $20,000 to pay the expenses of getting started. Such money may come out of the poor relief funds with the consent of the State Relief Commission.

"The Act delegates to the State Board of Housing the task of deciding the geographical limits in which the Authority shall work, but says it cannot be bigger than one county. In other states, where metropolitan areas overflow county lines, it might be well to make the metropolitan area the unit, and leave it to the State Board of Housing to determine just what its limits are."

Improving Macadam Pavements

Stone Screenings as a Blanket Layer Under Macadam Pavements Improve the Highway Structure

By **A. T. GOLDBECK**
Director, Bureau of Engineering, National Crushed Stone Association, Washington, D. C.

WHEN a layer of crushed stone is laid directly on the subgrade and pressure is applied to it during the rolling operations, naturally the stone will be forced downward as it is being compacted. The usual practice in macadam base construction is to use a layer of coarse stone, generally more or less of one size, although there has been a tendency of late to decrease the minimum size of stone required. The stone rests on the subgrade at a series of contact points, and the stone layer may contain more than 50 per cent of large-size communicating voids. When pressure is applied with the roller, these contact points penetrate more or less easily into the subgrade, depending upon its resistance.

THE EFFECT OF THE STONE SCREENINGS IN PREVENTING CLAY FORMS FROM PUSHING UP INTO THE MACADAM BASE COURSE

If the subgrade material is easily displaced, as may be the case with clay or fine, fairly clean sand, this displacement may take place upward into the voids in the stone. Clay intermingled with the stone will act as a lubricating agent and will greatly decrease the supporting value of the stone layer.

If a layer of stone screenings is first placed as a blanket course, and the large-size stone is placed on top of this course, the layer of screenings will effectively prevent the upward intrusion of the subgrade material into the voids in the stone. This is true because when pressure is applied to the layer of stone compacted, the stone will be pressed downward into the screenings layer, and the natural displacement of the subgrade and of the screenings which will occur under this pressure will force and wedge the screenings into the lower surface voids of the stone, and the clay will be effectively shut off from upward penetration.

A series of interesting experiments were performed last year in the laboratory of the National Crushed Stone Association to investigate the efficiency of stone screenings as a blanket course under a macadam layer. This experiment was performed by means of a circular track testing apparatus. The apparatus consists of a circular concrete track 14 feet in mean diameter built in the form of a trough 18 inches wide and 6 inches deep. A cast iron roller 6 inches wide and weighing 200 pounds per inch of width is mounted at the end of a radial arm driven by an electric motor through a speed reducer at the desired speed. The cast iron roller may be replaced with a rubber-tired wheel when necessary.

The two illustrations shown are cross-sectional views of the road surface. The first contains a clay subgrade with 2 inches of screenings interposed between the layer of stone and the subgrade. It will be noted that the clay was effectively shut off from upward penetration into the stone. In the second illustration, however, the stone was laid directly on the clay subgrade and then rolled. Note how the stone has been pushed almost completely through the 3-inch layer of clay, and how the clay has penetrated upward through the voids in the stone. One can readily imagine how unstable this condition might be if the clay were to become saturated with water.

WITHOUT THE SCREENINGS, THE CLAY BADLY "LUBRICATED" THE BASE STONE, AND REDUCED ITS STABILITY

Recommendations

As a result of these experiments, it would seem that when a macadam road is built on a clay subgrade, it would be a wise precaution to use a blanket course of screenings before laying the coarse stone. A layer from 1 to 2 inches in thickness should be sufficient for this purpose. This layer will serve to prevent the upward intrusion of the clay into the stone, and in this manner the inherent stability of the stone layer will be preserved. When the subgrade is composed of extremely finely divided clean sand, the screenings may not be efficacious when applied in a layer as thin as 2 inches.

ACKNOWLEDGMENT.—THE AMERICAN CITY is indebted to *The Crushed Stone Journal* for the two illustrations used in this article.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Home Rule for Texas Counties by Constitutional Amendment

FORT WORTH, TEXAS.—A county home rule amendment drafted about three years ago by a committee of the Fort Worth Chamber of Commerce was finally adopted as part of the state constitution by the voters of Texas on August 26. Under this new provision of the constitution, counties with a population of 62,000 or more may adopt a home-rule charter without action by the State Legislature; and smaller counties may do likewise if legislative approval is given by a two-thirds vote.

To quote an excellent brief outline by City Judge James R. Curtis, as published in *Public Management* for September, 1933: "This is the first step in Texas toward county-manager government. Under the legislation now in effect, the thirteen counties with more than 62,000 inhabitants may call an election to name delegates to a county convention at which a charter commission would be named to draft a charter for submission to the people. It is possible that some of the counties if they act at once can be operating under a new form of government early in 1934.

"An enabling act passed by the Legislature early this year and outlining the procedure by which charter commissions are to be formed, methods of submitting the charter to the voters, and so on, went into effect immediately upon the adoption of the amendment. It is worth noting that the amendment includes a provision for the partial or complete merging of the governments of the cities and towns in the county with the county government."

JACK H. HOTT,
Secretary, Fort Worth Chamber of Commerce.

NIRA Aids Roadside Improvement and Beautification

WASHINGTON, D. C.—Under the terms of the National Industrial Recovery Act, as outlined in the Rules and Regulations of June 23, 1933, "the appropriate landscaping of parkways or roadsides on a reasonably extensive mileage" is given an important position (second place) in the recommended priority of Federal-aid highway projects.

In this connection the following excerpts from a memorandum* prepared by the Bureau of Public Roads, at the request of the State Conservation Committee of South Carolina, may be of more than local interest:

"Roadside development is as much the preservation and control of scenic spots already afforded by nature as it is the creation of beauty through the supplemental introduction of trees and plants. The effective use of what is available is the wisest kind of public thrift. It is desirable to protect what is to be conserved. The elimination of nuisances and the exclusion of undesirable conditions foreign to the essential purpose of a highway is a vital step toward making the highways orderly and clean. Billboards and beauty do not blend. A reasonable control of roadside conditions, therefore, is vitally necessary for the protection of efforts directed to roadside improvement.

"If permanent benefit is to result, it is essential that highway rights-of-way be sufficient to provide needed space for tree planting and the adequate control of the improvement. The conservation and development of the natural beauty along state highways usually requires the informal type of planting design using native material carefully grouped in natural masses and irregular clumps, rather than the formal or artificial planting effects so often produced by placing trees or other plant material in monotonous straight rows regularly spaced on each side of the pavement.

"At the present time every community has a vital interest in the problem of unemployment. The work of roadside improvement is largely handwork. The flattening of slopes and ditches and the planting of raw cuts and intersections are the most effective ways in which many states are adding to the general attractiveness of their highways. Expenditures for this kind of work benefit local labor and other labor engaged in supplying plant materials. Roadside improvement work, while providing employment for labor, also creates scenic values. It is good business for a state to plan for the economic conservation of its highway investment."

WILBUR H. SIMONSON,
Senior Landscape Architect, Division of Design, United States Bureau of Public Roads, Washington, D. C.

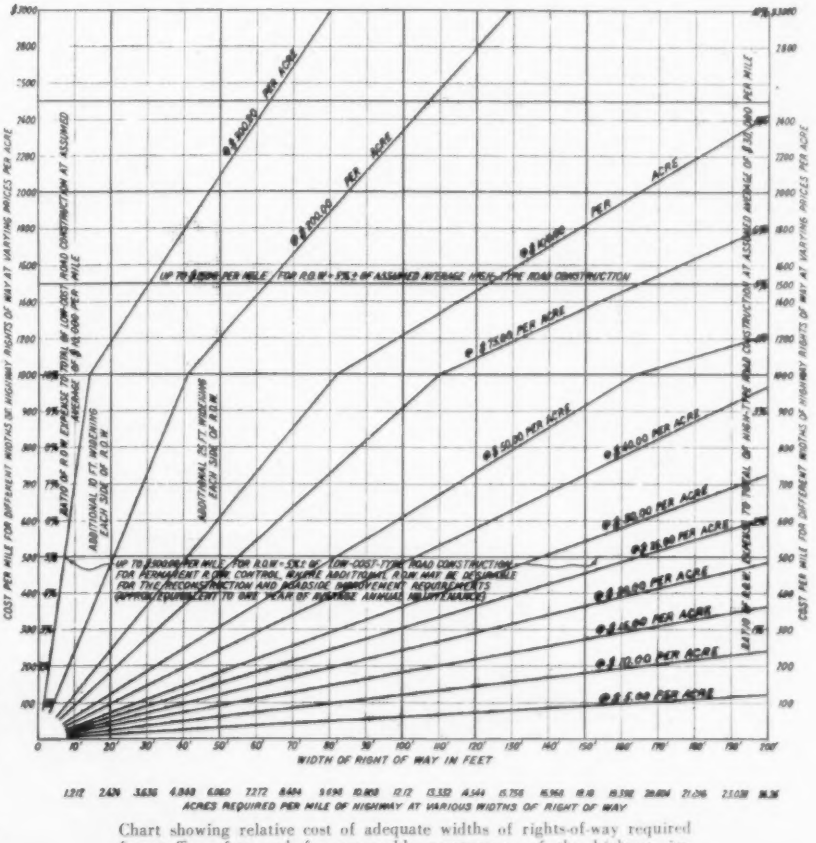

COST PER MILE FOR DIFFERENT WIDTHS OF HIGHWAY RIGHTS OF WAY AT VARYING PRICES PER ACRE
WIDTH OF RIGHT OF WAY IN FEET
ACRES REQUIRED PER MILE OF HIGHWAY AT VARIOUS WIDTHS OF RIGHT OF WAY
@ $200.00 PER ACRE
@ $100.00 PER ACRE
@ $75.00 PER ACRE
@ $50.00 PER ACRE
@ $40.00 PER ACRE
@ $30.00 PER ACRE
@ $20.00 PER ACRE
@ $15.00 PER ACRE
@ $10.00 PER ACRE
@ $5.00 PER ACRE
ADDITIONAL 10 FT. WIDENING EACH SIDE OF R.O.W.
ADDITIONAL 25 FT. WIDENING EACH SIDE OF R.O.W.
UP TO $3000 PER MILE FOR R.O.W. EXPENSE TOTAL OF LOW-COST ROAD CONSTRUCTION AT ASSUMED AVERAGE OF $15,000 PER MILE
UP TO $3000 PER MILE FOR R.O.W. = 5% OF ASSUMED AVERAGE HIGH-TYPE ROAD CONSTRUCTION
UP TO $3000 PER MILE FOR R.O.W. = 5% OF LOW-COST-TYPE ROAD CONSTRUCTION FOR PERMANENT R.O.W. CONTROL, WHERE ADDITIONAL R.O.W. MAY BE DESIRABLE FOR THE RECONSTRUCTION AND ROADSIDE IMPROVEMENT REQUIREMENTS (APPROXIMATELY EQUIVALENT TO ONE YEAR OF AVERAGE ANNUAL MAINTENANCE)
5% OF TOTAL OF HIGH-TYPE ROAD CONSTRUCTION AT ASSUMED AVERAGE OF $30,000 PER MILE

Chart showing relative cost of adequate widths of rights-of-way required for traffic safety and for reasonable permanence of the highway improvement in its relation to the problem of roadside development and to the total average cost of construction of low-cost and high-type highways at variable unit prices per acre

* As printed May 31, 1933, in *The State*, a newspaper of Columbia, S. C.

Electric Rates Announced by Tennessee Valley Authority

WASHINGTON, D. C.—At the direction of the Board of Directors of the Tennessee Valley Authority,* rates for electricity supplied from the publicly owned plant at Muscle Shoals have been formulated, after weeks of careful study of costs and market factors.

Any municipality, in the area we plan to serve initially, which owns its distribution system, assuming half-time use, may secure wholesale power from the Authority at an average cost to it of 7 mills a kilowatt-hour. We propose that our municipal wholesale customers charge the individual residence consumer in the towns and cities thus served a maximum gross rate of 3 cents a kwhr for the first block, and for subsequent blocks 2 cents, 1 cent, and 4 mills. For the typical general consumer, this is an average of about 2 cents a kwhr, and for the typical limited user an average of about 2¾ cents. For a fully electrified home—which is our objective—the rate would average 7 mills per kwhr.

The farm user, we propose, should pay the same rate for energy as the town and city householder. These schedules, both for town and farm, carry with them a requirement that the customer use a reasonable amount per month as a minimum. These minimum requirements vary, both in urban and farm territory, with the size of the customer's meter. Farm users will have a larger minimum requirement wherever the greater distances between customers result in increased costs of service.

These wholesale rates have been computed on a conservative basis to cover all the costs of furnishing the service, including operation, maintenance, depreciation, and taxes. In addition to these costs, we have made provision for interest and retirement, although such provision is not required by the Tennessee Valley Authority Act. The power project is designed to be strictly self-supporting and self-liquidating.

We believe that these low rates will mean that the people of the Valley will greatly increase their use of electricity—which is one of the objectives of the President and Congress. If this occurs, even lower rates can be planned for the future.

The proposed rates to the householder and farmer should be explained in more detail. Under the rate for domestic service, it is proposed that for the first 50 kwhrs which the householder uses he shall pay 3 cents a kwhr. These 50 kwhrs, in the ordinary small or medium-sized house, would care for the lights and small electrical appliances, such as the flat-iron, toaster, percolator, vacuum sweeper, washing machine, and similar small devices. For these 50 kwhrs the user would pay $1.50. If the consumer has an electric refrigerator and an electric range which together consume 200 kws, 150 of these kwhrs per month he would get 2 cents per kwhr, and the remaining 50 kwhrs at 1 cent. If in addition to an electric refrigerator and range the customer had an electric hot water heater, this service he could secure partly for 1 cent per kwhr, and partly for 4 mills per kwhr. All these services the consumer would receive for $6.70 a month. Any other appliances which the customer installed, such as electrical house heating or cooling, he could operate at 4 mills per kwhr.

It is apparent that the rates proposed are *designed to encourage and make possible the widest use of electric service*, with all the individual and community benefits which go with such wide use.

DAVID E. LILIENTHAL,
Member Board of Directors, Tennessee Valley Authority.

EDITORIAL NOTE.—Since the foregoing statement was released, there has been issued a supplementary statement dated September 15, explaining in some detail the methods of determining costs on which the proposed rates for Muscle Shoals power are based. This release is obtainable from the Tennessee Valley Authority, Temporary Building F, Washington, D. C.

* For a map and general outline of the Tennessee Valley Authority project, see pages 77-79 of THE AMERICAN CITY for September.

Comparative Ratings of Local Governmental Costs

To the Editor of THE AMERICAN CITY:

The most valuable yardstick for any community is that provided by other communities similarly situated. For this reason the comparative financial data of the cities and counties of Minnesota appearing in the 1933 Minnesota Year Book* is particularly worth while. Unfortunately, however, we can get only one side of the picture from these figures. They enable us to check up on the costs of local governmental services, but not on the services themselves.

This criticism is not intended to detract from the splendid work of the authors, but to emphasize the need for more adequate comparative data on governmental functions. For no other state has the writer seen such an admirable collection of comparative financial data for county, city, township and village governments. It is possible to tell at a glance from the tables and charts just where any local government stands, in comparison with others of its class, with respect to assessed valuation per square mile, per capita assessed valuation, tax rate, indebtedness, tax delinquency and a number of other financial factors.

What a check it will be upon our local officials when we shall be able to show as clearly the *services* that each county or city is rendering to its citizens! Governmental services cannot be measured as readily as tax rates and it may be a long time before the tools of measurement shall have been perfected sufficiently for us to make comparisons with assurance, but when this time comes we shall have made a tremendous stride toward efficient local government. We need all the statistics available on governmental revenues and expenditures, but we shall never be able to interpret these statistics intelligently until we have similar data for the other side of the equation, and can evaluate the governmental services which give to tax rates and bond issues their only excuse for being.

MABEL L. WALKER,
Executive Secretary, General Welfare Tax League, New York.

* See page 75 of this issue.

Good Schools in Bad Times

WHEN trouble comes, we turn to fundamentals. Home becomes dearer. Neighbors and friends mean more. We understand better the mission of the church. We appreciate the services of the school. If schools are a blessing in good times, they are an imperative necessity in bad times. They safeguard the health of the child; they fortify the home; they give hope and encouragement to citizens who are the victims of misfortune but who can take satisfaction that their children are cared for. The schools are ourselves working together in the education of our children. When times are hard we need to make that education better—to take more seriously our common task of preparing the young for life.

Times which suggest retrenchment call for increased safeguards for schools. Next to food, clothing, and shelter, they stand between us and chaos. Let us preserve and improve our schools. Let us keep the children first.

Taxes are the price we pay as citizens for such services as schools, playgrounds, parks, streets, police, and courts. Whenever we cut taxes, we must reduce some of these services to ourselves. Our public services—in proportion to their basic importance—are probably the least expensive services we buy.

Common sense suggests that in bad times we sacrifice first the less important things.

—A leaflet available in quantities from the National Education Association, Washington, D. C.

The Municipal Bond Market

Recent sales of new issues, from September numbers of *The Bond Buyer*:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$890,000	Springfield, Mass., Relief	3	1-5 (Ser.)	2.60
1,250,000	Worcester, Mass., Relief	3	1-5 (Ser.)	2.75
150,000	Cumberland Co., Pa., Refunding	3.5	5-19 (Ser.)	3.44
500,000	Minneapolis, Minn., Relief	3.5	2-5 (Ser.)	3.49
350,000	Warren Co., N. Y., Highways	4	12¼ (Avg.)	3.93
650,000	Manchester Conn., Water	4.5	20½ (Avg.)	4.36
1,180,000	Erie Co., N. Y., Relief	4.5	1-10 (Ser.)	4.47
160,840	Indianapolis, Ind., Funding	3.5	6 5/6 (Avg.)	3.49
170,000	Philadelphia, Pa., City	5	20-50 (Opt.)	5
1,000,000	Monroe Co., N. Y., Tax Revenue	6	1-5 (Ser.)	6

The Challenge of the Future to the City of Medium Size

To the Editor of THE AMERICAN CITY:

Eugene H. Klaber's article in your September number, entitled "Why the City of Medium Size Will Be the City of the Future," is as refreshing as a stein of old-time beer. I thank him and you for this relief to a parched palate, but nevertheless I am still a little in the dark about the *how* of this prophecy. There are two or three points I should like to ask questions about.

But in spite of my haziness, I want Mr. Klaber to know that I appreciate his fact-facing. This is like Patrick Geddes' own operating, and again, like Geddes, Mr. Klaber checks his conclusions by compass and ruler. This is stimulating, too. Geddes used to say that no plan was practical that could not be diagrammed. The blueprint was the Geddes test of practicality. This is worth remembering. If it were remembered more often, I suspect that a good many city planning sermons would be either revised or omitted. Mr. Klaber has performed a service in blowing the dust off it.

Yet Mr. Klaber's article, it seems to me, does not do full justice to Patrick Geddes or to the facts. As for Geddes' share, there is one more step necessary to complete the city picture. Geddes took the step; Mr. Klaber did not. Micropolis, Megalopolis and Metropolis tell only three-quarters of the story. To omit the last quarter breaks the point off Geddes' terminology and I think impairs Mr. Klaber's argument. The last quarter, the finish of the course, Geddes labeled Necropolis.

Has it been justified by facts, or is it to be rated merely as an epigrammtic spark from a Scotch professor's knuckle? Mr. Klaber passes up New York as a special case of metropolitan acromegaly, and unveils Chicago as his horrible example. We can all agree with his judgment in this, but he could just as well have selected Philadelphia. They are all three in the same general class and certainly in the same case. They are metropolises and they are monstrosities. In all of them functional paralysis has set in and the depression has speeded it up. Mr. Klaber lists some of the symptoms. He books rotten government, indigestible overcrowding, hardening of the arteries. But he overlooks the most serious symptom of all. These three victims of metropolitan gigantism are facing bankruptcy, and bankruptcy is a signpost of functional necrosis. It looks as if Geddes' justification is around the corner.

But Mr. Klaber also stops short in another direction, and it seems to me, an important one. He offers the smaller fry an entrance to the promised land, it is true. I can hear voices say that it is not a new one. Mr. Klaber does not claim to have discovered it, but on the strength of his evidence, he has made out a pretty stout case for Micro and Megalo to ponder. The fate of New York, Chicago and Philadelphia is a red lantern to warn them of their danger, and Mr. Klaber waves it valiantly. But with that he stops. He leaves the Big Sisters in the ditch and gives the Littler Sisters no hint of how they can begin to negotiate the desert. Perhaps he had no intention to do so at this time, but I am sure he will agree that the question is a vital one. How are they going to go about settling the limits of their growth? What machinery will they require to do it? Who is going to design and set up the machinery? And where does city planning as is fit into the picture?

I have often wondered about this, and after reading Mr. Klaber's article wonder still more. After all, when the depression settled the dust and brought us up all standing against hard fact, it began to look as if city planning as a logical and imperative necessity has not made so good a showing as some of us hoped. Nobody is wholly pleased with the results. This is equally true of England. The emasculation of the late English planning act by the Parliamentary committee is sad reading for the optimists on both sides of the Atlantic. Something must be wrong somewhere, and Mr. Klaber's clinic raises the questions I want to ask. They are not new neither, but, somehow, like truth, they refuse to die.

Has city planning been barking up the wrong tree? Where after all should a city plan start? Should it begin on the ground, run along the ground and end there? Some say Yes, but alas! how many city plans have even reached the ground stage? Can it be that a city plan must start somewhere else—that, as Patrick Geddes insisted twenty years ago, a city plan to be practical and effective must include more than a ground plan? Does it involve the whole works—finance, government and the humanities? And, most vital of all, publicity and legislation?

It may be a disturbing thought, but it seems to me that Mr. Klaber's article opens up once more, and this time in a solid, hard, projectile sort of way, a lode which American city planners might well assay still further. There are three metropolises virtually bankrupt from the causes which he diagrams. The Megalopolises which still have a lease on life can be numbered by the hundreds. If the diagrams and conclusions are sound, it will manifestly require more than some of us have figured to steer these cities straight. Can a plan to show these cities how to do it be drafted and set before them? Are the times ripe for it? Is such a plan feasible? If it isn't, and Mr. Klaber's diagnosis is sound, how far ahead will city planning be when the next "cycle" strikes us?

All this, of course, may be rated as mere idle dreaming, but Mr. Klaber has refreshed and stimulated at least one reader of THE AMERICAN CITY because he has come down out of the clouds and faced facts in a bold and intelligible way. But what are we going to do with the facts? Face them too, or efface them?

NATHANIEL S. OLDS.

130 East 22d Street, New York,
September 14, 1933.

Suburbanism "Come of Age"

To the Editor of THE AMERICAN CITY:

Referring to your recent article by Eugene H. Klaber, "Why the City of Medium Size Will Be the City of the Future," may I call attention to the following considerations:

Probably the most spectacular item of the last census was the rapid growth of places from below 100,000 to above that size. There were more than a score of these new "great" cities in the lists. Presumably this is the general class of places which Mr. Klaber refers to as "medium-sized"—places somewhere between 25,000 and 200,000.

This class of places is recently profiting by all phases of decentralization. About a third of them are suburbs; the others are provincial, with a significant fraction in interurban location. A strong majority of the most rapidly growing of this class are suburban.

Growth and loss are in general very good indexes of conditions in communities. But although growth indicates merit, a community may grow too fast for its own good. The thing that gives a community a high rating on many counts of appraisal as to general living conditions of all sorts is the *quality* of its people. If all large cities are rated on all possible ratable characteristics, the very largest cities fall halfway down the list of great cities; while the other classes over 100,000 are, in general, the better the smaller. Below 100,000, the larger cities rate better than the smaller. It seems evident that the "medium-sized city" has merits.

But on further analysis it is evident that it is not basally a matter of size of population, but of the *kind;* and secondarily a matter of *relationship* with other communities. And the kind of people is largely determined by its relationship. A large and growing proportion of these medium-sized, growing, high-rating, communities are suburban or interurban. Their merits are basally due to the fact that they are specialized parts of a complex.

The theory of Mr. Klaber's suggestive article calls for regional planning. But this is quite as vitally a matter of a planned metropolitan center as of planned suburbs.

A study of urbanism back through several business cycles and half a dozen decades, gives evidence that we are now past the heyday of the growth of great cities, i.e., metropolitanism. The last census seems to report a climax. Regionalism seems to be the next general stage, following this metropolitanism and the earlier general urbanism (most active about the middle of last century). By regionalism is meant independent, non-contiguous, non-annexable, permanently specialized suburbs—suburbanism "come of age"! This is the new suburban trend.

We are just now at the beginning of the growth and reorganization of the communities in this field. The contiguous larger-sized suburbs are now leading and predominate the field, but centers farther out in the suburban series have the prospect of the near future. This development naturally presupposes a more metropolitan metropolis. Both centralization and decentralization are embodied in the new design for such conurbanisms.

Hence, it is not the lesser cities *as such* that are the best prospects for the future, but these lesser cities in a proper relationship to the larger metropolis. Only then does lesser size have basal merits under the conditions of present-day civilization. An increasing number of isolated lesser cities are quite problematic.

Following the suggestion of Mr. Klaber's theory, it would be quite possible to diagram such regional organizations in actuality. For not all suburban communities are successful—the developments in metropolitan districts and regions are increasingly sporadic, i.e., localized and intensive. Architects, engineers, civic executives, and general business organizations, would do well to learn the detailed pattern which this oncoming regionalism is taking.

WILLIAM L. BAILEY,
Professor of Sociology.
Northwestern University, Chicago,
September 15, 1933.

Over-the-Counter Sale of Municipal Bonds

Pro and Con

"THE results of the experience of those municipalities which have tried selling bonds at retail has not thus far been sufficiently successful over a long period to warrant adoption universally as a permanent plan. A number of municipalities have found it advantageous to have in their charters or special laws a provision giving them power to dispose of their securities at retail, after failure to procure satisfactory bids. The plan may be successful in the smaller municipalities where there is a limited volume of bonds and where there is considerable wealth."

These are the general conclusions announced August 1, 1933, by the New York State Bureau of Municipal Information as a result of a study of over-the-counter sale of municipal bonds, conducted in compliance with a resolution adopted at the last annual meeting of the New York State Conference of Mayors and Other Municipal Officials.

Pro

The advantages of selling municipal securities at retail, as presented by advocates of the plan, are summarized as follows:

1. It enables a municipality to finance improvements that could not be otherwise financed.

2. It affords a leverage to hold municipal securities at a high rate while other securities have an uncertain market.

3. It serves as a medium for the small investor to place his money where he can receive a moderate rate of interest with absolute security.

4. It interests many more people in the financial standing and government of the municipality and makes of them better and more intelligent citizens, since they feel they have a greater interest in the municipal government.

5. It serves to keep a large amount of interest paid by the municipality at home, instead of sending it away to other money centers.

6. In some instances it permits municipalities to obtain funds at lower rates of interest than those at which banks were willing to extend their loans.

7. It permits municipalities to procure funds when money cannot be obtained by them in the bond market.

8. It encourages personal thrift and reduces hoarding.

Con

The disadvantages of over-the-counter selling as stated by opponents of the plan are also summarized:

1. It cannot be used by all municipalities or by any municipality at all times. The success of an over-the-counter sale depends upon the wealth of the community, and its ability to absorb the issue.

2. It makes it too easy, under certain conditions, for a municipality to finance public improvements which either should be financed by direct taxation, or should not be undertaken at all.

3. The opponents of the plan argue that if a municipality is not able to sell its securities by competitive bidding, there is something wrong either with the proposed project or with the financial condition of the municipality, in which event the municipality should not increase its debt. If general economic conditions affect the ability of a municipality to dispose of its securities, then they agree that either the Federal or the state government should assist.

4. After a municipality has exhausted its local market with several of these over-the-counter sales, it might not be able to dispose of future issues to large investors or syndicates.

5. It encourages reckless spending by municipalities for capital improvements.

6. Municipalities cannot obtain funds quickly enough under this plan to undertake the improvement when needed. When money is borrowed by a municipality it is to be used for some immediate purpose and is wanted substantially at one time and in considerable amounts.

7. Opponents of the plan argue that thrift can be encouraged and taxpayers can be interested in the financial standing and government of their communities by the municipalities putting their securities within the reach of people of small savings in another way. They advocate as a substitute plan, that municipalities issue their bonds in small denominations to be sold to and distributed by banks and syndicates. They argue that by making a broader market for their sale, the municipality will be able to sell them more advantageously. They further argue that the $100 municipal bond enables the citizen of small means to loan money to the municipality, thus giving him a safe investment and creating a greater interest in the affairs of the local government.

Mr. Chatters' Comment

Carl H. Chatters, Executive Director of the Municipal Finance Officers' Association, writes as follows: "When we understand who owns municipal bonds, it is easier to see that it would be difficult to dispose of a large percentage of any issue without dealing with certain classes of purchasers who probably would not deal directly with the city. In my opinion only 5 per cent of municipal bonds are held by so-called small purchasers; that is, the persons who have an annual income of less than $5,000. Probably 60 per cent of the outstanding bonds are held by large investors, by groups and by banks. I do not feel that these groups will buy from the city direct. Unless they will, it would be difficult to move any volume of bonds. I think the sale in this way should be tried and encouraged, as the city probably has nothing to lose and may find itself accomplishing something."

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

Comparative Visibility of Luminous and Non-Luminous Highway Signs

A 20-PAGE report of investigations by the United States Bureau of Public Roads in cooperation with the National Bureau of Standards, of "The Comparative Visibility of Standard Luminous and Non-Luminous Highway Signs," appears in the September number of *Public Roads*, the journal of highway research published by the United States Department of Agriculture. This investigation appears to demonstrate the superiority of yellow background for daylight visibility, and the efficiency of ¾-inch reflecting buttons for night driving. The findings of the investigation are briefly summarized as follows:

"1. *Daylight observation on non-luminous signs.*—All evidence points to the definite conclusion that the standard yellow background with black letters or design, under all conditions reasonably to be expected in either urban or rural driving, is much superior to black on white or white on black. In addition to the greater readability of the legend, the yellow background has a greater signal value, being more arresting to the average observer and more conspicuous by contrast with the average natural or artificial background. By the adoption of a definite shade and hue, it should be possible to prohibit the use of this distinctive shade for any roadside advertisements or signs other than official highway signs.

"2. *Night observations on non-luminous signs.*—While these observations were not in any way conclusive, the inadequacy of daylight signs for night driving was clearly indicated. The effect of a snow background was especially noted.

"3. *Night observations on luminous signs.*—Observations were made with three sizes of reflector button, 0.95-inch, 0.76-inch, and 0.58-inch, under conditions simulating both rural and city driving. The conclusion was reached that the colorless button with a diameter of 0.76-inch and a minimum spacing between buttons of 1 inch, center to center, is, in general, the most efficient. For rural use the 0.58-inch button has a superior long-range signal value, but is less readable than the unit of larger diameter.

"4. *Daylight observations on luminous signs.*—The effect on distinctness in daylight of inserting reflecting buttons in the letters is not serious at a distance of 200 feet, even though approximately 50 per cent of the area of the letter is taken up by colorless buttons. The difference in the effect on black and on white letters is negligible.

"5. *Recognition by shape of sign.*—The practice of outlining highway signs with reflector buttons, so that the road user may recognize a potential hazard at a distance by the distinctive shape of the sign plaque alone, is worthy of further development. The use of symbols, except for the arrows indicating curve or direction, is not considered as effective as outlining the sign with buttons."

"Reasonable Speed" Signs Reduce Highway Accidents

A TWO-YEAR experiment in appealing to motorists as reasonable beings has produced a substantial reduction in highway accidents on major highways in Rhode Island.

Since 1931, signs indicating the limits of "reasonable speed" have been placed in successive zones along the four main radiating highways of the state. Carefully based upon police and public accident records for the past eight years, the speeds are the highest consistent with safety. Such factors as that a dip hides an oncoming car at one point, fog is frequently found in hollows at another point, a great many accidents at speeds above fifty miles an hour have taken place at other points, were taken into consideration in determining the speed for the different zones.

The signs are set on portable standards on the shoulder of the road and are changed to lower speeds when the concrete is wet and are turned off entirely in cases of fog, ice or snow.

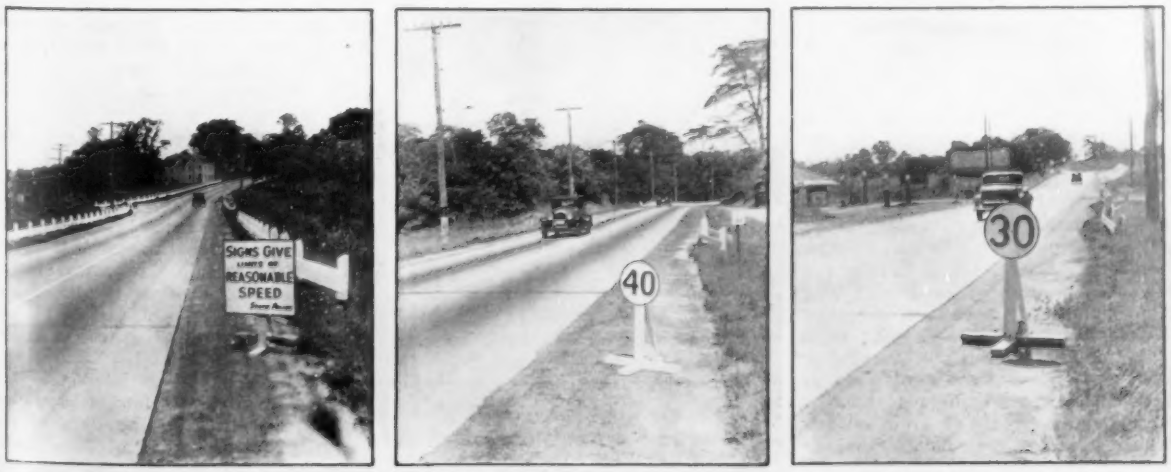
The psychological reaction to giving "reasonable speeds" rather than "speed limits" has been favorable. The signs answer the question: "Well, how fast can I safely drive?" Besides aiding in keeping the high-speed driver within limits, they have speeded up the slow driver, led to more uniform rates, less passing of overtaken cars, and hence, according to Superintendent E. S. Chaffee, of the Department of State Police, to fewer accidents.

Submitted by EDWIN TEALE.

Emergency Work Bureau Installs Directional Signs

MINEOLA, N. Y.—Nassau County, with an area of about 300 square miles, lying directly east of the New York City line, contains many fine beaches and state parks and has hundreds of thousands of visitors during the summer months.

The state roads and highways are well provided with guide signs, but the secondary roads which cross and wind about the country in every direction have long been a bugaboo to visiting motorists; in fact, residents of the county have, upon occasion, become lost and found themselves many miles from their destination.



"REASONABLE SPEED" SIGNS ON RHODE ISLAND HIGHWAYS

DIRECTIONAL SIGNS INSTALLED BY NASSAU COUNTY EMERGENCY WORK BUREAU

This condition was noted by the Traffic Accident Survey, a division of the Emergency Work Bureau, made up of unemployed business and professional men who have done valuable work collecting data on motor-cycle accidents, traffic volume and control. With the cooperation of the County Engineer and the approval of the Board of Supervisors, the Bureau, during the summer of 1933, has made up and installed approximately 1,000 directional signs at nearly all the important crossroads of the county. The work was planned and carried out under the direction of J. W. Fisher.

The first step in planning the work was to make a survey of the county to determine at which points to install signs and to select the best routes. Experiments were made to select the best materials for this purpose, with due regard for economy and permanence. Through the courtesy of Roosevelt Field, Inc., one of the airplane hangars was turned over to the project and a shop set up to do the actual labor of making the signs.

The signs are constructed of blue annealed 16 gage sheet iron with a rolled edge in standard units 6 by 30 inches and 8 by 30 inches; each sign consists of from one to six of these units bolted to a 4-inch square post, giving the appearance of one large sign. The metal units were sprayed with a gray primer and one coat of white enamel, with the lettering painted on afterward in black enamel. The posts were in two lengths, 8 feet and 12 feet, set 3 feet in the ground. They were primed with aluminum paint and given two coats of white enamel. The enamel paint used had a dull finish, for it was found that a high gloss reflected too much light at night to make them easily readable. In setting up the signs, one crew set the posts and a second crew bolted the units in place. The typical sign has three turning movements and two directions "ahead." Each unit has the name of one destination and approximate mileage. The 8-inch units are used where the words "ahead to" are necessary.

A particular feature of the installation of these posts is their location in advance of the intersection. This is in accordance with the latest and best recommendations of traffic engineers and the National Safety Council. It will no longer be necessary for the motorist to drive up to the crossroads, stop and read a dozen different signs to find the direction he wants. Anywhere from 50 to 150 feet before he reaches the corner, a large, easily read sign will tell him at a glance the direction to take at the intersection. This being settled leaves him free to concentrate on driving through the crossing. With nothing to distract his attention, it is claimed, the motorist will drive through the crossing with greater safety than would be possible if the sign were placed directly at the crossroads.

It is expected that these new signs will have a value far in excess of their cost in the good-will they engender among the many thousands of visitors the county attracts each summer. By erecting the signs as a relief measure, work is being accomplished of a lasting benefit to the county.

R. B. THOMAS.

How Los Angeles Administers Justice to Traffic Violators

A NEW Traffic Violators Court system has been set up in Los Angeles, which is believed to be the most modern and up-to-date traffic court and bureau in the United States.

Inspired with a desire to correct the motorist's impression that the issuance of tickets for traffic violations was a craftily devised scheme for building municipal funds, Presiding Judge Frank M. Smith of the Municipal Courts fought before the City Council and the County Board of Supervisors for the new court facilities.

MINIATURE AUTOMOBILES ASSIST INTERPRETATION OF TESTIMONY IN THE NEW TRAFFIC VIOLATORS COURT SYSTEM, LOS ANGELES

Offenders appear at alphabetically arranged windows marked "Traffic Bail Cashier" and pay a fine or bail of $2 for first offenders, $3 for second offenders, $5 for third offenders, and $10 for fourth offenders. The young women receiving the bail deposits listen to the grievances of the offenders, but they are not empowered to wave a hand in lieu of bail deposits.

The motorist, in appearing with his "ticket," follows a similar procedure in entering the Traffic Fines Bureau and in depositing bail, except that if he wishes to appear in court he proceeds across the hallway to the court room, drops his bail receipt in a box near the door, and within a few minutes is called before the bench. The plea is heard. If "guilty," the violator is given the opportunity to explain the circumstances, and a fine is assessed or suspended. The bail receipt then is applied in satisfaction of the fine, or is returned.

If the plea is "not guilty," the motorist is assigned to an adjoining courtroom where another judge is present to hear the plea and try the case. All violators cited under charges of "hit and run," "drunk driving" and "reckless driving" are assigned to this court. These charges being of a more serious nature, require more time for hearings and trials, and their separation from the adjoining court of "pleas" prevents delays to motor-vehicle operators charged with the more common offenses of parking overtime, speeding, failing to make a boulevard stop, etc.

Submitted by E. B. LEFFERTS, Manager, Automobile Club of Southern California, Public Safety Department.

Schoolboy Patrols Approved by the President

THE schoolboy patrol movement has received a hearty endorsement from President Roosevelt. In a letter addressed to Thomas P. Henry, President of the American Automobile Association, on the occasion of a parade in which 4,000 A.A.A. schoolboy patrols from Pennsylvania, Maryland, Virginia, North Carolina and the District of Columbia took part in Washington this last season, the President expressed his very real appreciation of the work of these boys as part of the great safety corps of 200,000 schoolboy patrols in 1,800 cities and towns in the United States. He continued:

"In addition to the day-to-day protection against accidents to school children afforded by the patrols, the movement is unquestionably a fine builder of morale. It also develops a sense of responsibility which cannot but make for good citizenship. It is my sincere hope that it will continue to expand and remain as a permanent feature of our national effort in the interest of traffic safety."

The President's deep interest in the patrols and in child safety, it is pointed out, extends back to the days of his first term as Governor of New York, when he often received and bestowed awards on boys cited for merit.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Finances

Financial distress held not to excuse municipal delay of steps to pay bonds (Florida Supreme Court: *Humphreys v. State*, 145 So. 858).

City held liable to payee of warrant drawn on bank which failed while draft in payment thereof was clearing (New York Supreme Court, Steuben County: *United States Pipe & Foundry Co. v. City of Hornell*, 263 N. Y. S. 89).

Legislature's Power

Right of Legislature to impose duties on municipalities in public interest held to extend to statute fixing minimum compensation of probation officers (Illinois Supreme Court: *People v. City of Chicago*, 184 N. E. 610). And statute charging city and county with pay of local registrar of vital statistics is valid (Colorado Supreme Court: *People v. McNichols*, 13 Pac. 2d, 266).

License Taxes

License tax of $5 per day imposed against transient photographers held void as being unauthorized by statute or charter (Oklahoma Supreme Court: *Ex parte Holmes*, 18 Pac. 2d, 1053).

Council did not abuse its discretion in refusing to issue to magazine dealer permit to sell cigarettes (Iowa Supreme Court: *Bernstein v. City of Marshalltown*, 248 N. W. 26).

Four per cent gross profits tax against telegraph and telephone companies upheld (Washington Supreme Court: *Pacific Telephone & Telegraph Co. v. City of Seattle*, 21 Pac. 2d, 721).

Excise taxes on purchase of electricity, gas, water, and telephone service upheld (Florida Supreme Court: *Heriot v. City of Pensacola*, 146 So. 654).

Gasoline storage tax upheld (Missouri Supreme Court: *State v. Blaine*, 58 S. W. 2d, 975).

$10 annual occupation tax on each branch maintained by lending libraries upheld (Georgia Supreme Court: *Steuer v. City of Atlanta*, 168 S. E. 7).

$1,000 tax against jewelry auctioneers held void as being discriminatory (Georgia Supreme Court: *Eplan v. City of Atlanta*, 168 S. E. 574).

Municipal Debts

Mandamus held proper remedy to compel levy of tax to pay bond principal and interest (Florida Supreme Court: *State v. City of Ft. Pierce*, 143 So. 733).

Municipal Utilities

Under statute, city held not empowered to acquire light plant without primary object of lighting streets, etc. (Kentucky Court of Appeals: *Juett v. Town of Williamstown*, 58 S. W. 2d, 411).

Nuisances

City held not jointly liable with canning company for independent nuisances committed in discharging offensive sewage, etc., into a stream to prejudice of landowners (Minnesota Supreme Court: *Johnson v. City of Fairmont*, 247 N. W. 572).

Sewage discharge in creek held nuisance redressible by damages award and not by injunction (United States Supreme Court: *City of Harrisonville v. W. S. Dickey Clay Mfg. Co.*, 53 Supp. Ct. 602).

City held liable to fish hatchery owner for polluting stream in discharging sewage, etc. (Washington Supreme Court: *Bales v. City of Tacoma*, 20 Pac. 2d, 860).

Official Publications

Bulletin publishing only municipal proceedings held not eligible as "newspaper" for publication of special assessment notices (Ohio Supreme Court: *Bising v. City of Cincinnati*, 184 N. E. 837).

Poor Relief

Bonds issuable to relieve poor, being for a "public purpose" (Missouri Supreme Court: *Jennings v. City of St. Louis*, 58 S. W. 2d, 979).

Owner of home and automobile held not exempt from poll tax as "public charge" (Kansas Supreme Court: *City of Liberal v. Blankenship*, 21 Pac. 2d, 892).

Private Driveways

Ordinance forbidding private driveways across sidewalks in city's busiest section held valid exercise of police power (Pennsylvania Supreme Court: *Farmers-Kissinger Market House Co. v. City of Reading*, 165 Atl. 398).

Public Utilities

Rates in franchise held not to preclude revision by subsequent ordinance (Texas Court of Civil Appeals: *Coleman Gas & Oil Co. v. Santa Anna Gas Co.*, 58 S. W. 2d, 540).

Electric utility held entitled to enjoin city from taking invalid steps to establish a competing plant (United States District Court, Northern District of Oklahoma: *Oklahoma Utilities Co. v. City of Hominy*, 2 Fed. Supp. 849).

Race Discrimination

Prohibition against colored high school pupils taking swimming lessons except with members of their own race held invalid (New Jersey Supreme Court: *Patterson v. Board of Education of City of Trenton*, 164 Atl. 892).

Removing Officers

Council's approval of official's dismissal effectively discharged him and was not revocable (California District Court of Appeal: *Doan v. City of Long Beach*, 20 Pac. 2d, 777).

Sewers

Owner not objecting to construction of sewer through his property held not entitled to later resist payment of assessment on ground of non-consent (Kentucky Court of Appeals: *Fischer v. James A. Diskin Co.*, 57 S. W. 2d, 538).

Assessments for sewer, based upon combination of front footage and area, upheld (Massachusetts Supreme Judicial Court: *Mullen v. Board of Sewer Commissioners of Milton*, 182 N. E. 641).

Street Improvements

As to special assessments previously levied and payable in cash, statute permitting payment in paving bonds held unconstitutional (Alabama Supreme Court: *Howard v State*, 146 So. 414).

City held not liable for officer's failure to certify delinquent special assessments to county treasurer (Oklahoma Supreme Court: *State v. Armstrong*, 13 Pac. 2d, 198).

City held not liable to abutter for unauthorized acts of another abutter in removing pillar and vegetation from parkway and diverting use of parkway. (Texas Court of Civil Appeals: *Fall v. Thompson*, 57 S. W. 2d, 252).

Abutter held entitled to damages for deprivation of access from one direction in closing of street to eliminate railroad crossing, although he had access from another direction (United States District Court, Northern District of Oklahoma; *Coy v. City of Tulsa*, 2 Fed. Supp. 411).

A landowner is not entitled to enjoin a street vacation unless specially injured (Texas Court of Civil Appeal: *Hartwell Iron Works v. Missouri-Kansas-Texas Railroad Co.*, 56 S. W. 2d, 922).

City's action in closing half of street held not subject to judicial review (Michigan Supreme Court: *Chene v. City of Detroit*, 247 N. W. 172).

Taxing Municipalities

Municipal exemption from taxation held not to extend to excise taxes imposed upon light plants, etc., operated for profit (Florida Supreme Court: *City of Lakeland v. Amos*, 143 So. 744).

Traffic Regulations

Ordinance forbidding crossing or turning about on a street other than at street intersections upheld (Washington Supreme Court: *Stack v. L. J. Dowell, Inc.*, 19 Pac. 2d, 125).

Establishing avenue as arterial highway did not authorize speed exceeding maximum fixed by state law (Washington Supreme Court: *City of Seattle v. Strang*, 14 Pac. 2d, 1112).

Ordinance forbidding left-half turns on causeway upheld (New York Supreme Court, Nassau County: *Jones Beach Boulevard Estates, Inc., v. Moses*, 259 N. Y. S. 53).

EVERYTHING you want in a piece of fire-fighting equipment... ...but no frills*

NOT NEXT YEAR!
NOT NEXT MONTH!!
NOT NEXT WEEK!!!
NOT *TOMORROW*

BUT—TODAY

WHEN the unemployed men in your city are put to work, you will want materials, MATERIALS and still more MATERIALS—TODAY.

BUT—you will not want "just any" materials — you will want DEPENDABLE materials such as COLUMBIAN hydrants and valves have proved themselves through the years.

WE have anticipated your probable needs and we have the materials—COLUMBIAN materials—waiting for your order.

THESE COLUMBIAN hydrants and valves are not hastily assembled — they are being made before the rush — scientifically tested and assembled in the most thorough and careful manner.

QUICK SHIPMENT — COLUMBIAN QUALITY

Do these meet your requirements?

COLUMBIAN IRON WORKS, CHATTANOOGA, TENN.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Garage — Practical Difficulty and Unnecessary Hardship

NEW YORK.—*Matter of Rindfleisch and Rindfleisch, Petitioners, v. Bayley and others, comprising Board of Appeals, and Faillace, Building Inspector, of Village of Mamaroneck* (Supreme Court, Westchester County), reported in *Westchester Law Journal*, August 9, 1933.—The petitioners are owners of a plot of land on Palmer Avenue, which is a street of heavy traffic, mostly foreign to the neighborhood. On it there are very few residences, and numerous businesses and garages. There has been no material change in the avenue for fifteen years. The area in question is in a business district in which the construction of garages is forbidden. The petitioners applied for permission to erect a garage in the area and the application was refused. The Board of Appeals also refused to allow it as an exception. This suit is certiorari to the Court, to overrule this decision of the Board of Appeals, so as to obtain the right to locate the garage there.

The Court decided that the Board of Appeals be reversed, and the petitioners be allowed to construct the garage. Under present conditions the erection of a building on this site designed for any other use, such as stores or apartments, or both, would be economically unsound, and would result in financial failure. A clear case of unnecessary hardship, in forbidding the garage, is therefore presented, and the Board of Appeals, in the exercise of its sound discretion, should have permitted it. If the district should grow and develop so that business may be profitably conducted on the site, the legal proposition would change with the circumstances, and conformity with the regulations of the zoning ordinances for the district would be required; in which case, upon the application of the village authorities, they could compel the removal of the garage.

Private Covenants—Garage—Tourist Camps

PENNSYLVANIA.—*Douglass v. Queeney*, 167 Atl. 453 (Superior Court, July 14, 1933).—The plaintiff Douglass was the owner of a tract of land on which there was a house in which she lived. In this dwelling house the plaintiff conducted a "tourists' home" for keeping overnight guests and serving meals. The plaintiff conveyed part of this tract to Christy H. and John A. Frazier, with the right to use the water in a spring on the tract in common with plaintiff; with the restriction on the land conveyed that it might be used for a picnic ground, a refreshment stand at which only light lunches, but no meals, should be served, a station for the sale of gas and automobile accessories, the erection of not more than two dwelling houses to be used as dwellings only, and for no other purpose. This portion of the tract the Fraziers sold to the defendant Queeney, by deed containing the same restrictions. The defendant erected on the land four sleeping cottages, which were rented to tourists and were furnished only with a bed, a looking-glass, towel, water and chair. These cottages were occupied by these tourists only for the night.

The plaintiff brings this action for the removal of these cottages, claiming that their erection was a violation of the restriction. This claim the Court sustains. The covenants were mutual covenants to prevent conflict between the businesses of the parties to it. The cottages were not dwelling houses, within the meaning of the covenants. A dwelling is a place where there is some permanency of occupancy.

Zoning Ordinance—Residence District

OHIO.—*City of Cincinnati v. Struble*, 30 (N. S.) Nisi Prius Reports 280, reported in 38 *Ohio Law Bulletin and Reporter* of June 5, 1933 (Common Pleas Court of Hamilton County, March 31, 1933).—The defendant Struble is conducting a restaurant and soft drink parlor in a residence district in which business is prohibited. The defendant claims that, as to him, this prohibition is arbitrary and unreasonable, and that these provisions of the ordinance are therefore an unconstitutional taking of his property. The restriction has in fact materially reduced the value of defendant's property.

If the health, safety and convenience or general welfare of the part of the city affected is promoted by placing defendant's property in a residential district, then it makes no difference that the defendant suffers financial loss or inconvenience thereby. The Court decides, however, that the restriction on the operation of the business conducted by the defendant at that locality did not bear a substantial relation to the public health, safety, morals, convenience and public welfare of the inhabitants of the immediate vicinity, and that therefore the restriction as to him is unconstitutional and void. This decision of the Court is based upon the fact that the property in question is located in a district which is subject to overflow in times of high water, which is generally industrial, and which contains but a few residences, none of which were constructed within the last fifty years; and that there is a public demand for such a use at the locality, and it may be conducted there advantageously. As one of its authorities, the Court cites the well-known case of *Nectow v. City of Cambridge*, 227 U. S. 183.

Long-Range Planning and Budgeting of Public Works

Information Bulletin No. 14, of the Regional Plan Association, New York City, dated August 21, 1933, gives recent information with regard to legislation to establish agencies for long-range planning and budgeting of public works in the nation and the various states.

In an attempt to coordinate the construction and maintenance activities of some eighty or ninety Federal agencies, to which were added the twenty or thirty agencies in the city of Washington, the National Government set up a Federal Employment Stabilization Board, under an act approved by the President, in February, 1931. An account of its activities in the city of Washington is contained in "Advance Planning of Public Works in the District of Columbia" (Government Printing Office, price 10 cents).

In the last two years, bills providing for long-range planning of public works have been introduced in at least eight state legislatures—California, Connecticut, Massachusetts, New Jersey, New York, Pennsylvania, Washington and Wisconsin. The California bill, which is fairly typical, provides for a state public works planning board, whose functions would be to prepare a ten-year construction program for all state public works, including a tentative assignment of each project to a given year; to administer this program in such a manner as to restrain construction during years when business and employment are active, and to accelerate it during periods of depression; biennially to revise the ten-year program, adding projects for two additional years; to require the preparation of detailed plans of individual construction projects at least one year in advance; to promote advance planning and programming of public works by municipalities and counties.

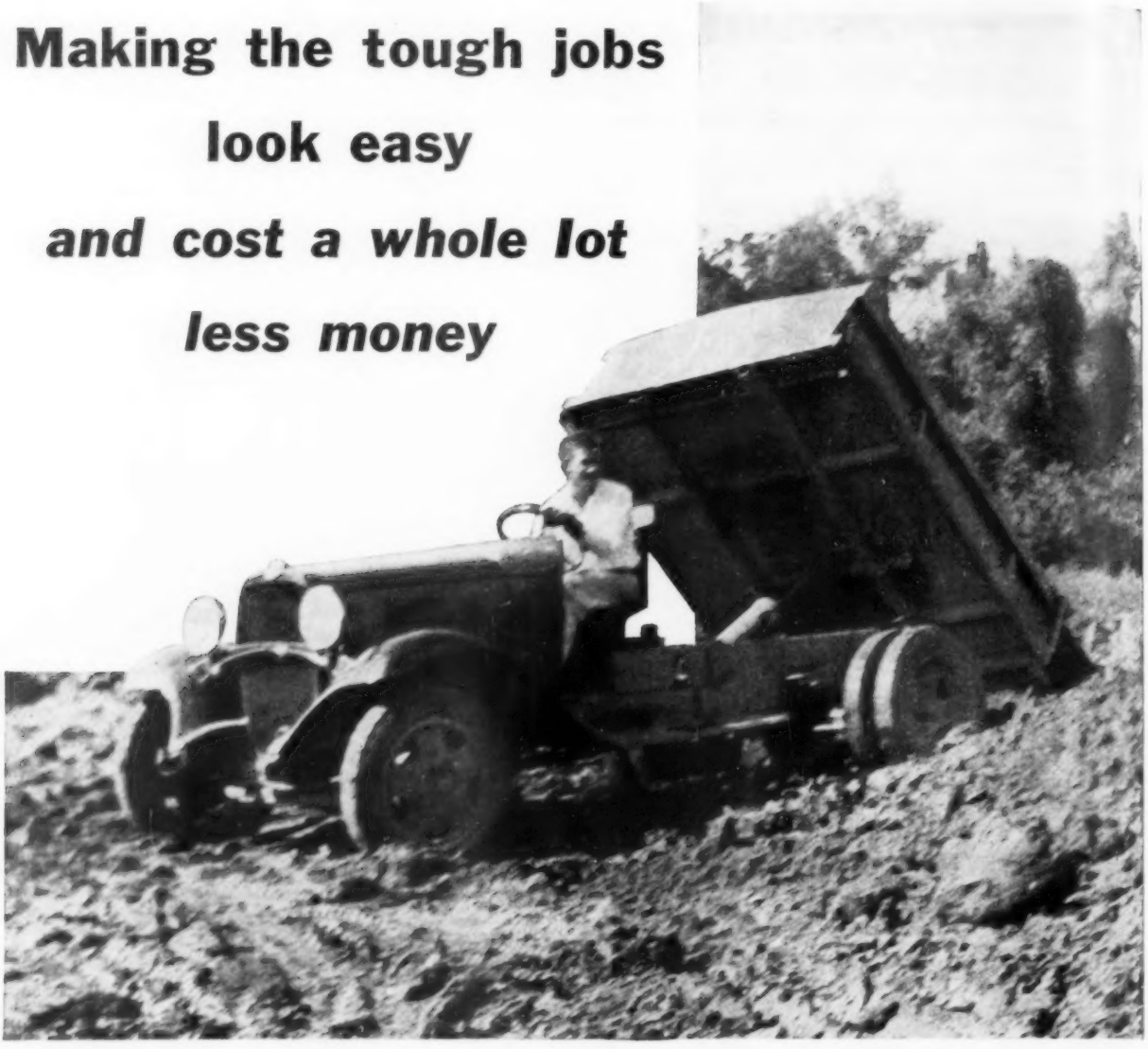
Zoning in Los Angeles County, California

The Seventh Annual Report of the Zoning Section of the Los Angeles County Regional Planning Commission, for 1932, contains a list of the amendments to the County Zoning Ordinance during the year and an account of a number of specific cases coming up for consideration during the time. A radical departure from the usual practice of establishing building lines, put into effect during the year, and described in the report, is by the aid of a building-line line map.

An Important Reference List

For classified references to decisions on zoning and city planning that were noted in this department during 1932, see the 1933 Municipal Index.

Making the tough jobs look easy and cost a whole lot less money



CHEVROLET When it comes to bidding on a construction job, the man with Chevrolet trucks has a big advantage over the man with any other kind. The Chevrolet owner can quote his figure on the basis of the *lowest hauling costs available.* He can confidently plan on spending the very minimum on gas, oil, upkeep and repairs. He can look forward to day after day of steady, hard work from his Chevrolet, with a minimum of time off for repairs. He can trust his Chevrolet not to "let him down" even on the toughest jobs.

As a result, he is in a position to make a more attractive bid than the man without a Chevrolet. He is also in a safer position to protect his profit on the job.

Evidently, most contractors don't need to be reminded about this. They're already going for Chevrolets in a great big way. Especially since the president launched his big public works program, the demand for Chevrolets for construction work has been unusually heavy—much greater than for any other low-priced trucks.

And this demand, together with the call for Chevrolets from every other hauling field, is putting the leader ahead of the truck field by the biggest lead in its history. More Chevrolets are being bought today than any other trucks in America.

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN
Division of General Motors

CHEVROLET TRUCKS

with special low ratio rear axle for construction work

MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Constructive Economy

Government in a Depression: Constructive Economy in State and Local Government.—Edited by Thomas H. Reed, Chairman, Committee on Civic Education by Radio of The National Advisory Council on Radio in Education and The American Political Science Association. The University of Chicago Press, Chicago. X + 202 pp. $1.00.

Records of 16 spirited, intelligent, timely programs broadcast under the auspices of the Committee on Civic Education by Radio and presenting discussions by authorities in the field of government, economics and municipal finance. Advance announcement of this far-sighted civic undertaking, with its detailed program, was given on page 85 of THE AMERICAN CITY, September, 1932.

Government

Minnesota Year Book, 1933.—League of Minnesota Municipalities. Minneapolis. 1933. 519 pp. $5.00.

An impressive array of statistical data concerning the finances of the state, county, township and municipal governments of Minnesota is presented in this fourth annual year book. Counties, cities and villages have been painstakingly rated with respect to various financial factors. The volume is also a storehouse of information concerning the legislative, judicial and administrative branches of the government. It will prove helpful to all who are concerned with local governmental affairs in any part of the country, and will be invaluable to students of Minnesota government.

Finance

The Tax Situation in Michigan.—By Harcourt L. Caverly. Michigan Municipal League, Ann Arbor, 1933. 66 pp., multigraphed. $1.00.

This survey is a compilation of essential data concerning the state finances. Of particular interest is the discussion relating to the recent constitutional limitation of the property tax to 15 mills. The legal issues raised by the amendment and the fiscal and procedual results are considered.

Control of Local Finance Through Taxpayers' Association and Centralized Administration.—By Claude R. Tharp. M. Ford Publishing Company, Indianapolis, 1933. ix + 84 pages. $1.00.

A summary of the methods of control employed in various states, and a discussion of the part which voluntary organizations of taxpayers are taking in controlling local expenditures. The essentials of an effective plan are considered to be: (1) an approach to the problem from the standpoint of expenditures as related to the local units' ability to pay; (2) a mandatory budgetary system applicable to every governmental unit of the state; (3) a state supervised unified accounting system; (4) a mandatory state audit of the accounts of local governments; (5) a local Board of Review and a State Board of Review to which appeal may be made pertaining to local finance; (6) an aroused and informed citizenship cooperating with public officials through statewide taxpayers' associations.

MABEL L. WALKER.

Employment Stabilization

A bulletin of the Employment Stabilization Research Institute of the University of Minnesota, Minneapolis, Minn., issued September, 1933, entitled "Occupational Testing and the Public Employment Service," has been prepared by John G. Darley, Psychological Examiner, St. Paul Occupational Testing Division; Donald G. Paterson, Professor of Psychology; and I. Emerick Peterson, State Director of Testing and Guidance. 28 quarto pp. Illustrated. It reports the demonstration testing project carried on in the Minnesota public employment offices in Minneapolis, St. Paul and Duluth during the year ending July 1, 1933. The results of these experiments, and the recommendations for the future, are clearly presented and, naturally, of great value. (Send 10c postage to the Institute.)

Traffic Safety

The American Automobile Association (Pennsylvania Ave. at 17th St., Washington, D. C.) has published (July, 1933) a report on "Normal Safe Approach Speeds at Intersections," which presents, in form for practical use, a method for reducing accidents between vehicles approaching certain corners with inadequate visibility. It has been prepared by Burton W. Marsh, Director, Safety and Traffic Engineering Department of the Association, and Edwin I. Stein, from a more detailed analysis made principally by the authors, as part of the work of the Philadelphia Office of Traffic Engineering, Department of Public Safety. 48 multigraphed pp. Views, diagrams, tables. "This study was undertaken in the belief that motorists will slow down in accordance with the sign or signal, once they understand that the definite approach speed has been carefully determined, *and is not just someone's guess!*" (Apply to the Association.)

Sanitary Engineering

"Entwässerung und Abfallstoffbeseitigung in Siedlungen," by Oberingenieur Franz Fries, Ruhrverband, Essen, Germany—12 pp. "Die Abhängigkeit der Schlammfaulung von der Temperatur," by the same—1 p.; "Die Anwendung der aktiven Kohle zur Entphenolung des rohen Ammoniakabwassers," by Dr. F. Sierp, Chefchemiker des Ruhrverbandes—5 pp.; "Beurteilung der Wasserverschmutzung mittels des Filterblätterverfahrens," by Dr. Sierp—9 pp. 4 pamphlets in German. (Apply to the Ruhrverband, Essen, Germany.)

Reading Courses

The American Library Association (520 North Michigan Ave., Chicago, Ill.) advises readers of THE AMERICAN CITY to *ask at public libraries* for the Association's reading courses on various subjects in the field of current public affairs, announced under the general head of "Exploring the Times." Especial attention is called to "Less Government or More?", by Louis Brownlow and Charles S. Ascher.

Roads

The "Proceedings of the Nineteenth Annual Road School," held at Purdue University January 23-27, 1933, has been compiled and edited by B. H. Petty, Professor of Highway Engineering, as Extension Series No. 30, of the Engineering Extension Department. 114 pp. It contains 22 papers on various divisions of the field of highway and bridge engineering, motor transport, snow removal, relief work, etc. 114 pp. Illustrated. (Apply to the Engineering Extension Department, Purdue University, Lafayette, Ind.)

Boston's Public Works Program

"The Participation of Boston in a Public Works Program under the National Industrial Recovery Act" is issued in a pamphlet of 66 mimeographed pages with drawings, charts, and tables. It includes a General Summary of Recommendations, and four Parts: General and Legal Background; Financial Status of Boston—Expenditures, Taxation, and Debt; Mayor's Program of Public Works Projects—Transit and Traffic Relief, Reconstruction and Repair of Streets, New Schoolhouse Construction, Police Stations, and Other Projects; Execution of Projects. August, 1933. (Apply to H. C. Loeffler, Secretary, Boston Municipal Research Bureau, 40 Central St., Boston, Mass.)

Unemployment Relief

Public Administration Service (850 E. 58th St., Chicago, Ill.) has published for the American Public Welfare Association a valuable compilation and analysis entitled "Federal and State Legislation for Unemployment Relief and National Recovery, 1933," by Marietta Stevenson and Lucy Williams Brown, of the Association's staff. September, 1933. 19 pp. 25c. This manual of current bills and amendments reveals the standards shown in the Federal legislation and makes possible illuminating comparison between legislative developments in different states. (Apply to the Service.)

School Finance

The Report of the National Conference on the Financing of Education, held under the auspices of the Joint Commission on the Emergency in Education of the National Education Association and the Department of Superintendence, at Columbia University, New York, July 31—August 11, 1933, has been published by the Department of Superintendence (1201 16th St. N. W., Washington, D. C.). 78 pp. Presenting, after a vast amount of research and experience, the essentials of a modern school finance program. (Apply to the Department.)

"Constructive Economy in Education" is the title of the September, 1933, Research Bulletin of the National Education Association (1201 16th Street N. W., Washington, D. C.) The Research Division of the Association and other agencies have made important studies of the principles and methods of economical school administration, the findings of which are here organized and reviewed. 32 pp. Tables, charts, 25c. (Apply to the Division.)

County Government

The Supplement to the September, 1933, *National Municipal Review* contains "Principles of a Model County Government," by R. C. Atkinson, of the Ohio Institute, Columbus, Ohio. This is Report No. 2 of the Committee on County Government of the National Municipal League. The Foreword is by John A. Fairlie, Chairman of the Committee. 20 pp. A proposed plan of reorganization is given, which, subject to local constitutional requirements, is suitable for embodiment either in a county government law of state-wide application or in an individual county charter. (Apply to the National Municipal League, 309 E. 34th St., New York.)

Bridges

"Analysis of Rigid Frame Concrete Bridges," an illustrated pamphlet of 32 pages, was published last month by the Portland Cement Association. It includes the general theory of rigid frame concrete bridge design, and nine problems with the details of their solutions. "A rigid frame with arbitrary layout and loading may be completely analyzed by following the procedure presented in the problems." There is a section on Stress Determination and one on Skew Rigid Frames. Charts; bibliography. (Apply to the Association, 33 W. Grand Ave., Chicago, Ill.)

Recreation

The Y.M.C.A. of New York City is putting on the air (WJZ, New York, and associated stations) September 13—November 15, this fall, a series of broadcasts about the hobbies which offer profitable enjoyment to those who have increased leisure time. Interesting announcements of these programs, and accompanying book lists, may be obtained from the Association, 420 Lexington Ave., New York.

National Recovery

"NRA—The New Deal for Business and Industry: A Bibliography, May-August, 1933," together with a list of official publications of other new governmental agencies, has been compiled for The John Crerar Library by Jerome K. Wilcox. It is issued in 78 mimeographed pages by the American Library Association, 520 N. Michigan Ave., Chicago, Ill. About 1,800 references are cited in the bibliography itself. (Apply to the Association.)

Other Reports Received

HAWAII.—Report to the Governor of the Territory by the Superintendent of Public Works, year ending June 30, 1932. 64 pp. and many folding tables.

HUNTINGTON, N. Y.—Master Plan Report, June 7, 1933. 16 pp., with folding Plan Map and Street Map. (Apply to Secretary, Planning Board, Town Hall.)

WEAVING THE WORLD OF SPEECH

DAILY, as upon a magic loom, the world is bound together by telephone. There, in a tapestry of words, is woven the story of many lives and the pattern of countless activities.

In and out of the switchboard move the cords that intertwine the voices of communities and continents. Swiftly, skilfully, the operator picks up the thread of speech and guides it across the miles. Constantly at her finger-tips are your contacts with people near and far.

She moves a hand and your voice is carried over high mountains and desert sands, to moving ships, or to lands across the seas. London, Paris, Berlin—Madrid, Rome, Bucharest—Capetown, Manila, Sydney—Lima, Rio Janeiro and Buenos Aires—these and many other cities overseas are brought close to you by telephone.

Every day go messages vital to the interests of nations, the course of international business, and the affairs of individuals. Fifty operators, speaking a dozen languages in all, work in relays at the overseas switchboard in New York.

Great progress has been made in the past few years in extending the scope of this service, in speeding connections and in giving clear transmission. Today, more than 90% of the world's telephones are within reach of your Bell telephone.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

OCTOBER 2-6.—CHICAGO, ILL. (3,000)
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 3-6.—CHICAGO, ILL.
Institute of Traffic Engineers. Annual meeting. Secretary-Treasurer, Hawley S. Simpson, 175 Fifth Avenue, New York.

OCTOBER 5-6.—ASBURY PARK, N. J. (500)
New Jersey State League of Municipalities. Annual convention. Executive Secretary, S. S. Kenworthy, Trenton Trust Building, Trenton, N. J.

OCTOBER 7-9.—INDIANAPOLIS, IND.
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, R. E. Tarbett, U. S. Public Health Service, Washington, D. C.

OCTOBER 8-13.—ATLANTIC CITY, N. J. (500)
American Prison Association. Annual congress. General Secretary, E. R. Cass, 135 East 15th Street, New York.

OCTOBER 9-11.—MILWAUKEE, WIS.
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

OCTOBER 9-11.—BALTIMORE, MD.
American Civic Association, Inc. Joint meeting with the National Conference on City Planning. Executive Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 9-11.—BALTIMORE, MD.
National Conference on City Planning and American City Planning Institute. Joint meeting with the American Civic Association. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

OCTOBER 9-12.—INDIANAPOLIS, IND.
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

OCTOBER 11-13.—HOLDREDGE, NEBR. (500)
League of Nebraska Municipalities. Annual meeting. Secretary-Treasurer, C. E. Beals, 407 East 12th Street, Crete, Nebr.

OCTOBER 12.—INDIANAPOLIS, IND. (100)
Central States Sewage Works Association. Joint meeting with the American Public Health Association. Secretary-Treasurer, G. H. Radebaugh, Urbana & Champaign Sanitary District, Urbana, Ill.

OCTOBER 16-21.—CHICAGO, ILL. (2,500)
American Library Association. Annual convention. Secretary, Carl H. Milam, 520 North Michigan Avenue, Chicago, Ill.

OCTOBER 16-20.—PHOENIX, ARIZ. (500)
National Tax Association. Annual conference. Secretary, W. G. Query, South Carolina Tax Commission, Columbia, S. C.

OCTOBER 16-19.—OKLAHOMA CITY, OKLA. (350)
Southwest Water Works Association. Annual convention. Secretary, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 16-18.—CHICAGO, ILL. (200)
Special Libraries Association. Annual convention. Secretary, Rebecca B. Rankin, Municipal Reference Library, Municipal Building, New York.

OCTOBER 16-18.—HARLINGEN, TEXAS. (300)
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

OCTOBER 17-21.—CHICAGO, ILL. (200)
American Institute of Steel Construction, Inc. Annual convention. Executive Director, Charles F. Abbott, 200 Madison Avenue, New York.

OCTOBER 19-20.—MINNEAPOLIS, MINN. (75)
American Water Works Association—Minnesota Section. Annual meeting. Secretary-Treasurer, Ronald M. Finch, 240 South Fourth Street, Minneapolis, Minn.

OCTOBER 19-20.—PEORIA, ILL. (350)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 19-20.—FINDLAY, OHIO. (125)
Ohio Conference on Sewage Treatment. Annual convention. Secretary-Treasurer, J. R. Collier, Elyria, Ohio.

OCTOBER 19-20.—ATLANTIC CITY, N. J. (300)
Pennsylvania Water Works Association. Annual meeting. Secretary, F. Herbert Snow, 327 Telegraph Building, Harrisburg, Pa.

OCTOBER 20-24.—OAKLAND, CALIF.
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, R. F. Brown, P. O. Box 506, Stockton, Calif.

OCTOBER 23-25.—CHANUTE, KAN. (250)
League of Kansas Municipalities. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 24-26.—DENVER, COLO. (100)
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

OCTOBER 24-25.—LOS ANGELES, CALIF.
Western States Taxpayers' Association. Annual convention. Secretary, Rupert F. Asplund, Taxpayers' Association of New Mexico, Sante Fe, N. Mex.

OCTOBER 26-28.—ST. LOUIS, MO. (100)
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

OCTOBER 27-28.—WHITE PLAINS, N. Y.
New York State Sewage Works Association. Annual meeting. Secretary-Treasurer, A. S. Bedell, State Department of Health, Albany, N. Y.

OCTOBER 30—NOVEMBER 3.—CHICAGO, ILL.
American Association of Pools and Beaches meeting in conjunction with the convention of the National Association of Amusement Parks. Executive Secretary of the A.A.P.B., Lyle L. Jenne, 725 Bulletin Building, Philadelphia, Pa.

OCTOBER 31—NOVEMBER 1.—CHICAGO, ILL.
National Association for Better Housing. Annual convention. Secretary, Henry A. Guthrie, 59 East Van Buren Street, Chicago, Ill.

NOVEMBER 6-8.—STATESVILLE, N. C. (300)
American Water Works Association—North Carolina Section. North Carolina Sewage Works Association. Joint annual meeting. Secretary, H. G. Baity, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 6-10.—MINERAL WELLS, TEXAS. (200)
Texas Public Health Association. Annual convention and School. Acting Secretary-Treasurer, Mrs. M. Pierson, State Board of Health, Austin, Texas.

NOVEMBER 8.—ATLANTIC CITY, N. J.
Governmental Research Association. Annual meeting. Secretary-Treasurer, Robert M. Paige, Drexel Avenue and 58th Street, Chicago, Ill.

NOVEMBER 9-11.—ATLANTIC CITY, N. J.
National Association of Civic Secretaries. Annual convention. Secretary, Miss H. Marie Dermitt, Hotel William Penn, Pittsburgh, Pa.

NOVEMBER 9-11.—ATLANTIC CITY, N. J.
National Municipal League. Annual convention. Acting Secretary, Howard P. Jones, 309 East 34th Street, New York.

NOVEMBER 13-14.—NEWPORT NEWS, VA.
Virginia Water and Sewer Works Association. Annual meeting. Secretary, H. W. Snidow, 601 State Office Building, Richmond, Va.

NOVEMBER 16-18.—AMES, IOWA. (100)
Iowa Sewage Treatment Conference. Iowa Wastes and Disposal Association. Joint meeting. Secretary-Treasurer, Lindon J. Murphy, Iowa State College, Ames, Iowa.

DECEMBER 5-7.—BRANDON, MAN. (300)
Union of Manitoba Municipalities. Annual convention. Sec., John Spalding, Miniota, Man.

DECEMBER 7-8.—WASHINGTON, D. C. (200)
Highway Research Board of the National Research Council. Annual meeting. Director, Roy W. Crum, B and 21st Streets, Washington, D. C.

DECEMBER 8-9.—ATLANTIC CITY, N. J. (300)
New Jersey Health and Sanitary Association. Annual meeting. Secretary, Edward Guion, Box 418, Atlantic City, N. J.

DECEMBER 9.—LOS ANGELES, CALIF. (150)
California Conference on City Planning. Secretary, C. J. S. Williamson, Chamber of Commerce Building, Los Angeles, Calif.

JANUARY 6.—BOSTON, MASS.
Massachusetts State Association of Selectmen. Annual meeting. Executive Secretary, Harris A. Reynolds, 4 Joy Street, Boston, Mass.

JANUARY 17-19.—NEW YORK.
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

APRIL.—AUGUSTA, GA. (250)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

City Managers Hold Exceptionally Successful Convention

THE twentieth annual conference of the International City Managers' Association, held in Chicago on September 18 to 20, was the largest in the history of the Association. A total of 290 were registered during the three-day conference, of which number 91 were city managers representing cities in 28 different states. Only twice previously did the attendance exceed 200, once at Asheville in 1928, with 204, and at Cincinnati in 1932, with 228.

Effective methods of collecting taxes, keeping the public informed on city activities, methods of securing revenues to supplement the property tax, the refunding of municipal bonds, reducing incendiary fire losses, coordinating adjoining police agencies, handling press releases, and personnel problems, were discussed by city managers at group sessions on the morning of the second day of the conference. Other sessions held during the conference included: municipal finance; traffic safety; establishing sound pay schedules for public employees; and matters pertaining to the city manager profession. About fifty city managers made three-minute talks on their most difficult problems during the current year.

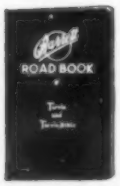
The officers elected for the coming year were: Willard F. Day, City Manager, Staunton, Va., President; R. M. Evans, City Manager, Dubuque, Iowa, Roy S. Braden, County Manager, Arlington County, Va.; and E. J. Donnelly, City Manager, Two Rivers, Wis., Vice-Presidents. In addition to these officers, the Executive Board includes O. E. Carr, C. M. Osborn, John N. Edy, Charles A. Carran, and C. A. Dykstra. Clarence E. Ridley continues as Executive Director.

A brief excerpt from Mr. Dykstra's presidential address appears on page 55 of this issue. The complete proceedings of the conference will appear in the City Manager Yearbook, to be published by the Association early in 1934.

Barrett Tarvia

GOOD ROADS at LOW COST

Tarvia surface treatment at Cullman, Alabama



Write for your copy of this Barrett Road Book containing useful information on the proper use of Tarvia and Tarvia-lithic.

The Barrett Company

New York	Chicago	Philadelphia
St. Louis	Minneapolis	Boston
Detroit	Cleveland	Hartford
Buffalo	Columbus	Milwaukee
Providence	Syracuse	Birmingham
Lebanon	Toledo	Cincinnati
Baltimore	Youngstown	Bethlehem
Rochester		Portland, Me.

THE BARRETT COMPANY, Ltd.
Montreal Toronto Winnipeg Vancouver

Postponing needed road improvement merely increases the expense to all concerned. Poor roads save no one any money, or time. There is no calculating what they cost business and farmers in lost profit and opportunity—or taxpayers and motorists in inconvenience.

Take advantage of the few remaining weeks before winter sets in. Whether you have new roads to build, old roads to surface or widen, or patching to be done, there is always a fast and economical way to do them with Tarvia. Tarvia economy includes low first cost and low upkeep, as well as speed of completion.

Tarvia is made only by The Barrett Company, America's oldest and most experienced manufacturer of coal-tar road-building materials. All of Barrett's unmatched facilities for prompt delivery and dependable service are available to you through the Tarvia field man. 'Phone, wire or write our nearest office.

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A New Standard Line of Medium-Pressure Gate Valves

For more than forty years the Western Gas Construction Co., Fort Wayne, Ind., has designed and manufactured difficult-service valves of the low-pressure type. The valves' principal feature, the wedging mechanism, has been used throughout this time, rendering efficient and satisfactory service. To adapt the features of this low-pressure gate valve to a medium-pressure valve was a problem tackled several years ago. The company now offers the Western A.W.W.A. medium-pressure, double-disc, parallel-seat gate valve for water-works service.

The valve is made for 150 pounds per square inch, maximum water working pressure, and is tested to 300 pounds per square inch hydrostatic pressure. The cast iron parts are made from superior quality nickel iron with a tensile strength of 35,000 to 40,000 pounds per square inch. The diameter of the valve stem equals or exceeds A.W.W.A. specifications, and all threads are milled in a lathe for accuracy and smoothness. The double discs are symmetrically dished, supported at the center, are free to rotate, and are so designed that the valve may be installed in any position. The valve is simple and direct in action, and the opening requires less effort than the closing, owing to pressure on the discs being relieved before the discs slide off the seats.

The closing pressure in Western A. W. W. A. gate valves is applied through wedges on one arm of the wedge arm. The wedge arm is rotated on a bronze bushed pin in the yoke, by having the one arm of the crank strike a lug on the valve body when the discs are centrally located over the seats in the valve body. On the inside of the disc at the center line there is a recessed boss which receives the lugs on the yoke. When the valve is in the closed position, the clearance between the yoke lug and the recess on the disc is sufficient to allow the disc to remain stationary under the closing pressure. Likewise, when the valve is opened, the pressure on the discs is relieved before the discs slide off the seats. In other words, the wedging mechanism locks after the discs are over the valve port and unlocks before the discs move over the seats. Therefore, the effort required to open the valve is much less than the effort to close it.

Veteran Water-Works Manufacturer Dies

Edwin H. Ford, President of the Ford Meter Box Co., Wabash, Ind., died at his home on September 3. Mr. Ford, who has been known by thousands of water-works operators throughout the country and was the Dean among water-works manufacturers and salesmen, had been in poor health for two months. Born in 1861, Mr. Ford lived in Wabash, Ind., until 1881, when he moved to Hartford City, where he founded the Ford Meter Box Co., which was incorporated in 1911 when the business was moved to Wabash.

A Fully Automatic Zeolite Water Softener

Following the development of an automatic zeolite water softener for household use, the Permutit Co., 330 West 42nd Street, New York, developed a self-regenerating softener for use in the industrial and municipal fields. The design now in successful use is shown in the accompanying diagram. It employs a multiport single valve having a rotary flat disc, the ports of which are so arranged that by turning the disc to four successive positions the four operations of a complete cycle are carried out, and the control mechanism is so arranged that the duration of each operation of the complete softening cycle can be separately adjusted and controlled. The valve is rotated by an electric motor through a gear drive, and the valve stops after reaching the correct position for each operation.

The means employed to control each operation are briefly as follows:

1. For the end of the softening run, a water meter with a special adjustable contact head is installed.
2. For backwashing, a time switch and rate of flow controller.
3. For salting or regenerating, a float switch controlling the drawing down of the desired volume of brine from a measuring tank.
4. For rinsing, a time switch and rate of flow controller.

The finally developed apparatus was put through a long period of testing through thousands of cycles equal, in the ordinary use of the softener, to many years of operation.

The multiport single valve is rotated by the electric motor from one position to the next, and when it reaches each successive position the motor is stopped by the opening of a circuit breaker and the valve remains stationary in that position until the end of that operation. The automatic valve remains in the softening position until a predetermined volume of water has passed through the meter. The meter then closes a control circuit which starts the valve motor, rotating it to the backwash position. As soon as this position has been reached, the mechanism in the time switch automatically starts and the backwash operation continues for a predetermined time interval. At the end of that time interval, the time switch again starts up the valve motor and revolves the valve to the brining position.

A small pipe connection from the multiport valve is supplied with water pressure when the valve is in this position. This water pressure actuates the brine valve on the suction side of the brine ejector. The ejector operates, lifting brine from the measuring tank to the softener. When a predetermined depth of brine has been withdrawn from the measuring tank, the float switch located in this tank closes the control circuit, which starts up the valve motor again and the motor rotates the valve away from the brining position to the rinsing position. As in the backwashing step, so in this rinsing step the time switch controls the period of rinsing. At the end of that period the valve motor is started again, which rotates the valve back to the original softening position.

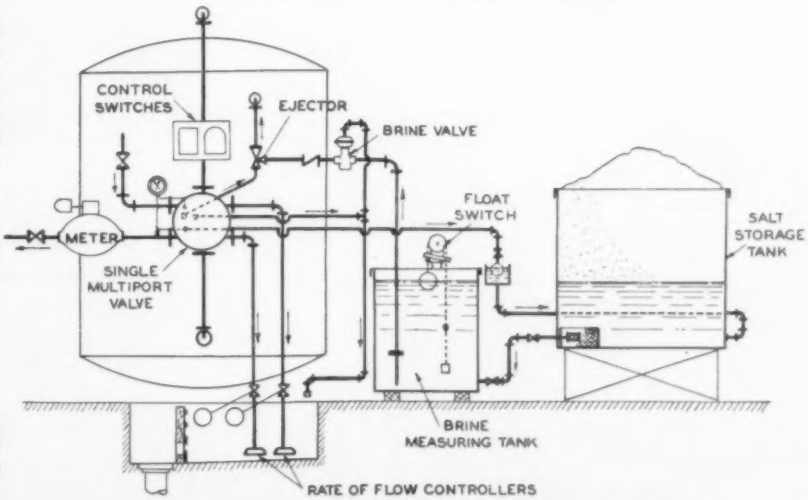


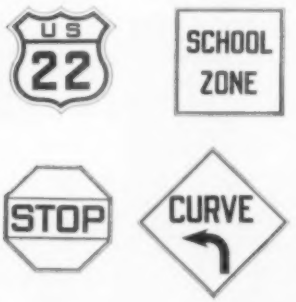
DIAGRAM OF THE PERMUTIT AUTOMATIC ZEOLITE WATER SOFTENER

A 4-Star Steel Sheet for Quality Steel Signs

Superior Galvannealed steel sheets are an *improved metal* for all types of products where rust resistance, finish, workability and long life are important. Signs of all kinds—street signs, highway signs, road markers, etc.—made from Superior Galvannealed resist rust better, take the finish better and undergo severe forming and embossing without fracture of the coating.

We shall be glad to refer you to a manufacturer who can supply your requirements for steel products made from Superior Galvannealed.

THE SUPERIOR SHEET STEEL COMPANY
CANTON, OHIO
Division of Continental Steel Corporation



★ Superior Galvannealed is a special analysis steel sheet.

★ A hot dip heat treated zinc coating is bonded to the base metal.

★ Coating will not chip, flake or peel under difficult forming or embossing.

★ Surface adapted to receive paint, lacquer or enamel finishes.

Superior Galvannealed
PATENTED PROCESS

Stewart FENCES

For Every Public Property Need

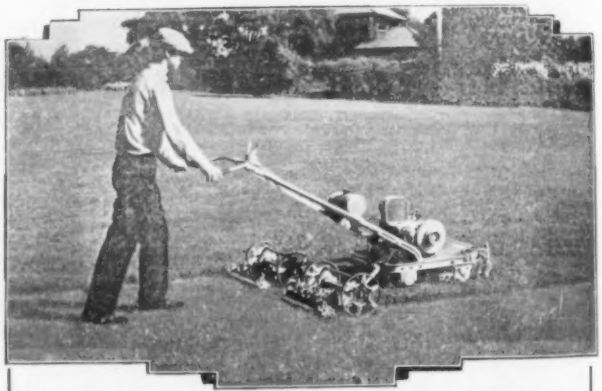
Stewart Fences of Iron or Chain Link Wire are available in a wide range of designs from which it is possible to select a "type" peculiarly adaptable to the need.

For 47 years Stewart Fences have served faultlessly as a protection to valuable public properties including parks, playgrounds, schools, reservoirs, etc.

Write for interesting catalog.

The STEWART IRON WORKS CO., Inc.
915 Stewart Block Cincinnati, Ohio

SINCE 1867
COLDWELL



Above: Coldwell "L-Twin" motor lawn Mower and roller. Mows and rolls simultaneously 4 to 6 acres a day on one gallon of gasoline. With gang units attached it cuts a 60-inch swath, ten acres per day on one gallon of gasoline.

A Dependable and Economical Power Lawn Mower Is Bound to Be Satisfactory

THE Coldwell Power Lawn Mowers and Rollers perform the two operations simultaneously which cut the cost and produce finer results.

The Twin cylinder motors deliver an abundance of power for all cutting conditions and provide large capacity mowing at small expense.

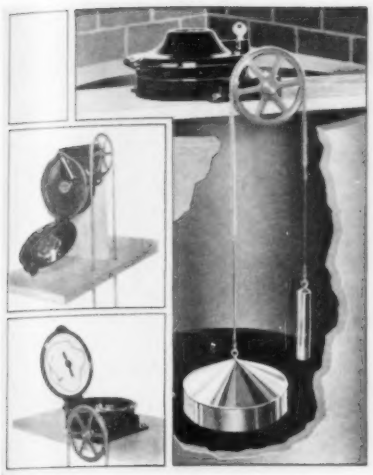
Sturdy but simple construction throughout insures dependable performance.

There's a style and size suited for any type of lawn.

Sales and Service facilities in all principal localities.

Full particulars on request.

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y., U. S. A.
In Canada—Taylor-Forbes Co., Ltd., Guelph
Manufacturers of **DEPENDABLE** *Lawn Mowers* — HAND, HORSE, GASOLINE, ELECTRIC



THE NEW SERVICE WATER-LEVEL RECORDER

A New Water-Level Recorder

A water-level and flow recorder with a number of new features and a wide range of applicability has been developed by the Service Recorder Co., 468 Hanna Building, Cleveland, Ohio. This device makes a record of the level of the liquid by means of a sapphire point which scratches the record on a wax-covered paper, removing the wax and exposing a fine line of bright red, the color of the paper beneath.

The recorder with its float and sprocket mechanism is mounted immediately over any tank, manhole, or weir chamber, and the copper float is placed within the receptacle and has a range of 16 feet. The recorder weighs approximately six pounds, and by means of two or three different sprocket wheels it is possible to obtain different ranges of records. The standard model contains a three-day clock and chart, but where the records vary widely the charts can be used for seven or eight days.

Other uses for this mechanism are the recording of the number of discharges of a siphon at sewage treatment plants, the recording of the number of openings of by-pass gates, and other records of intermittent levels of various liquids.

A Stable, Flexible, Non-Skid Pavement

In recent years traffic in all classes of highways has grown by leaps and bounds. The increases in volume, speed, and amount of truck traffic require careful laying-out of a highway route and the selection of a surface which will properly withstand not only present but future demands and which will be non-skid in character. The Interstate Amiesite Co., Inc., du Pont Bldg., Wilmington, Del., is now offering approved road-surfacing materials the latest development of which is Interaco stone tread, a pre-mixed, cold-lay, asphaltic surfacing. In the manufacture of Interaco stone tread two dissimilar asphalts are used. As these asphalts are combined at low temperatures, they do not readily flux, but laboratory tests and actual paving use show they do flux when the mixture is spread in a thin sheet on the highway. The resultant asphalt is stable at high summer temperatures and sufficiently flexible in low winter temperatures.

This stone tread is manufactured in the company's own plant and shipped in gondola cars and is readily unloaded by hand or by clamshell buckets. It is dumped from the trucks at the site of the work, and heating is unnecessary to make it workable. It is used for resurfacing worn macadam, concrete, brick, and asphalt roads and streets and is laid with relatively unskilled labor with the minimum of essential equipment. The manufacturers claim that it does not ravel or crack and may be laid without a curb or header. Traffic may pass over it while it is being laid, thus eliminating any need for detours.

The Interstate Amiesite Co. has manufactured over twenty-five million yards of cold-lay paving materials and has carried on extensive research in order to offer its various paving customers uniform paving of high quality.

INTERACO STONE TREAD IS EASILY HANDLED

Skilled labor is not required and but little equipment is needed

President of Layne & Bowler, Inc., Dies Suddenly

Lloyd F. Layne, President of Layne & Bowler, Inc., and Layne Central Co., manufacturers of Layne pumps and Layne gravel wall wells, died recently, the victim of pleurisy. In addition to his Memphis firms, Mr. Layne was President of corporations extending from South America to Indo-China. A native of South Dakota, he formerly lived in Houston, where he was educated. He had been a resident of Memphis since 1917 and was known nationally both for his business and for his flying ability.

Prominent Fire-Alarm Official Dies of Injuries

A. D. Wheeler, prominent for 45 years in the municipal fire-alarm field and one of the best-known men among New England Fire Departments, died in the Boston City Hospital on August 17 as the result of injuries received the day before on his way to work from his home in Norwell, Mass. Mr. Wheeler spent an entire lifetime in the municipal signal business, having been New England District Sales Manager for the Gamewell Company of Newton, Mass., for 35 years, and in addition served as its Vice-President for the past several years.

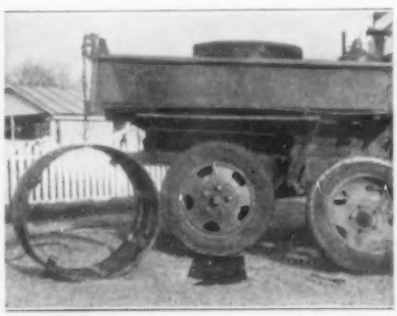
The Gamewell Co. has just announced the election of Warren J. Miller as Vice-President to fill the position left vacant by the death of Mr. Wheeler. Mr. Miller has been with the Gamewell Company for twenty years, during part of which time he served as Office Manager both at the New York office and at the factory. Later he became Production Manager and Assistant Treasurer. Now in addition to his new duties as Vice-President, he will continue the work of Production Manager.

Using Trucks for Maintenance and Fine Grade Rolling

By the development of an auxiliary roller wheel which can be used with dual pneumatic tired trucks, the New England Metal Culvert Co., 10 Alger Street, Boston, Mass., makes it possible to use the standard maintenance truck or the contractor's utility truck for rolling shoulders or fine grade. The Lawrence auxiliary roller wheel is attached to any light truck, converting it into a 6-ton roller giving a compression of 240 pounds per square inch.

The Lawrence auxiliary roller wheel consists of a wide steel band that fits over the rear wheels of a dual-pneumatic truck, held in place by means of flanges between the sets of tires. It does not affect the riding or traveling qualities of the truck at a reasonable speed, and may be left on or removed with little effort.

To install the maintenance roller, both rear tires are deflated and the outside wheel removed. The auxiliary roller wheel is then slid over the deflated tire of the inside wheel, leaving the lugs sufficiently clear to prevent pressure against the side of the tire when inflated. The outside of the wheel is then replaced and both tires are inflated to normal pressure. The unit is then ready to put onto the road for smoothing and compressing patches, rolling shoulders and rolling and compressing coverings applied after seal coats of bituminous material. It has also been used in connection with the construction of gravel, bituminous macadam and retread bituminous-mix roads of moderate size. It can be used effectively for rolling fine grade on concrete prior to the pouring of concrete slab.



PREPARING TO MOUNT A ROLLER WHEEL ON A TRUCK

PERMANENCE
for Public
Improvements

Build for Permanence. Insure that permanence by enclosing your public properties with sturdy long-lasting Pittsburgh Chain-Link Fence . . . We will gladly cooperate with municipal and county authorities in drawing up specifications and estimates for fencing any property. Please write to us.

PITTSBURGH STEEL CO.
Union Trust Bldg. • Pittsburgh, Pa.

Pittsburgh Fence

"Snow-Flo" Principle In Action

The above illustration shows clearly the flow of the snow as a ROSS plows through it. This easier, faster snow removal means to you that you can keep *more miles* free of snow *with less trucks, with less labor, with fewer plows,* and *at less expense.*

No matter how deep the snow—no matter what kind of truck you have—here is a plow that will not skimp the job! It throws the snow clear off the road where it does not have to be moved again.

Write for illustrated circular on the

ROSS SNOW PLOW

THE BURCH CORPORATION
CRESTLINE, OHIO

MONARCH *Reversible Blade* SNOW PLOWS

Universally adaptable to any standard make of motor truck. Equipped with manual or hydraulic lifting device.

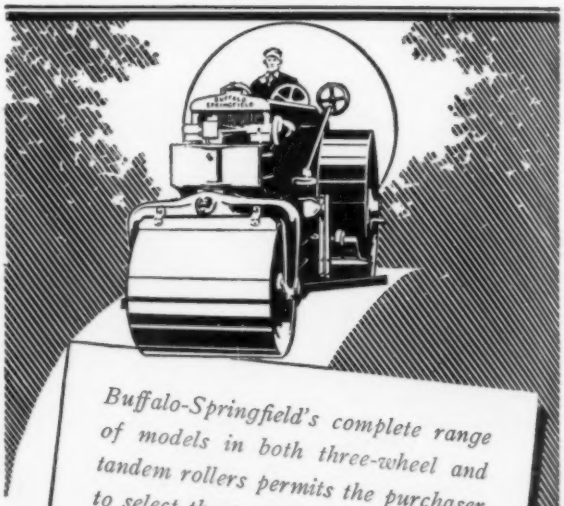
Electrically Welded

Ask for our Bulletin

NRA

Built by

Monarch Mfg. Co., Inc.
WILMINGTON DELAWARE



Buffalo-Springfield's complete range of models in both three-wheel and tandem rollers permits the purchaser to select the proper machines for his work.

NRA WE DO OUR PART

The Buffalo-Springfield Roller Co.
Springfield, Ohio

BUFFALO-SPRINGFIELD

A MAGNETIC AUTOFLAG SIGNAL INSTALLED ADJACENT TO A FIRE STATION IN CHICAGO

Fire-Stop Traffic Signals

The Autoflag or Wig-Wag type of signal has become known to the motoring public as a stop signal at railway grade crossings. Because of its merit as an indicating signal, several fire stations have installed this type of sign to warn pedestrians and motorists that fire apparatus is about to emerge from the fire station.

This signal operates on the closed circuit principle, and when fire-alarm relays are in their normal position the banner is hidden behind the shield showing "Fire Dept." When an alarm is received, the hold-clear circuit of the Autoflag signal is opened and the banner drops out from behind the shield and swings through an arc of approximately 45 degrees, displaying the words "Fire-Stop." A light in the center of the banner, which is easily visible both day and night, is also displayed. The installation is simple, since 110 volts, 60 cycle, is connected direct to the terminals in the signal at all times, and one side of the alternating current is taken through the front contact on the alarm relay, which energizes the hold-clear circuit when the relay is in normal position. The Autoflag traffic signal is made by the Western Railroad Supply Co., 2330-2360 South Ashland Avenue, Chicago, Ill.

Engineering Clinic Formed

Recognizing the need of an engineering group in the Northwest equipped to study and handle efficiently and completely any engineering problem and to design engineering works, a group of six well-known consulting engineers of Minneapolis, Minn., have organized the Associated Consulting Engineers.

The group is composed of M. Dwight Bell, Mechanical and Power Engineer; Edward P. Burch, Electrical Engineer; Russell H. Bennett, Mining and Sanitary Engineer; Harold E. McWethy, Specialist in transportation, valuation, rate and taxation problems; Adolph F. Meyer, Hydraulic Engineer; and Walter H. Wheeler, Structural and Designing Engineer. The headquarters and offices of Associated Consulting Engineers will be at 1908 Foshay Tower Building, Minneapolis, Minn.

Recognition of Bureau of Contract Information

In Article V of the Code of Fair Competition for the General Contractors Division of the Construction Industry, and in the Section, "Contract Prequalification Requirements," of the Highway Construction Industry Code supplemental to the Construction Industry Basic Code, it is required that contractors file complete information regarding performance and financial status with the Bureau of Contract Information, Inc., Washington, D. C., or any other agency authorized and designated by the Public Works Administrator.

The Bureau was organized to definitely establish the facts concerning performance records of individual contracting concerns throughout the United States as developed during the last three years of their work. It carries forward the individual performance records when such have once been established, and as further contracts are awarded, bonded and performed. It discloses this verified information regarding the performance records to those legitimately entitled to them by reason of being responsible for the award of public and private construction contracts, the writing of surety contract bonds and the extension of credit. These N.R.A. codes admirably back up the valuable work which the Bureau has carried on so faithfully for a period of three years and which should be referred to more frequently by municipal officials.

A Power Spray Outfit for Curing Concrete Roads

A power spray outfit which includes a tank and power pump mounted on rubber-tired wheels, and a separate spray unit, has been developed by the Aeroil Burner Co., Inc., Park Avenue at 13th Street, West New York, N. J., for applying bituminous materials to concrete roads for curing or for color coating. The spray boom is 12 feet wide with an apron 10 feet wide, and is mounted on three rubber-tired wheels. The spray bar can be shortened for 10- or 11-foot roads and is provided with attachments to spray the sides of the concrete slabs. Standard equipment includes 18 hardened steel spray nozzles. The air and liquid control valves are provided near the spray boom for the operator.

The power unit is a 5-hp air-cooled engine with a regulator and hand starter. It has a 2-cylinder heavy-duty air-cooled roller-bearing air compressor driven by three V belts, and has a capacity of approximately 25 cubic feet of free air per minute. It is mounted on a channel iron base with the 120-gallon capacity welded steel tank, which has two air relief valves, a pressure gage and two shut-off valves. These are mounted on a trailer with four 4.00 x 18 pneumatic-tired, roller-bearing steel wheels, with the front wheels swiveled to permit sharp turns. The outfit is equipped with two 25-foot lengths of high-pressure air and solvent hose with bronze unions and ground joints.

THE NEW AEROIL SPRAY BOOM FOR UNIFORMLY COATING CONCRETE PAVING WITH ASPHALT

A Road Tar Research Program

What is said to be the first exclusive road tar research program undertaken by any American university has just been started at the University of Pittsburgh, Pittsburgh, Pa., with the cooperation of the Koppers Products Co., Pittsburgh, Pa. The work is under the direction of Prof. Adelbert Diefendorf, Associate Professor of Civil Engineering and head of the Department of Highway Engineering at the University.

Prof. Diefendorf was formerly a member of the engineering faculties at the University of Illinois and the University of New Mexico. Associated with him in the work are E. O. Rhodes, Director of the Technical Department of the Koppers Products Co., and J. H. Swanberg, Research Associate of Mr. Rhodes.

The University has undertaken the work because of the shifting of the emphasis in highway work to the low-cost forms of construction, and because the University is situated in the center of the great by-product coal fields of Pennsylvania and West Virginia, from which large quantities of the country's coal tars come. The University has acquired a complete laboratory for the analysis of bituminous highway materials and the determination of strength, durability and other characteristics of the finished pavement.

Installation of Dresser Couplings in Washington, D. C.

The S. R. Dresser Manufacturing Co., Bradford, Pa., has made arrangements with the Washington, D. C., Water Department for water-works officials to inspect the new Washington 48-inch Dresser - coupled water line under construction during the period between September 1 and November 1. Those interested may secure a map from Dresser showing the location of the installation in the city of Washington.

M·S·A
FIRST AID
EQUIPMENT

"A man may be down but he is never out," with an MSA First Aid Kit on the job—contains everything necessary to properly treat wounds, burns, fractures, shock or severe bleeding.

The MSA Heavy Duty First Aid Kit illustrated, is an excellent all purpose kit and is available in four sizes, —10, 16, 24, and 36 units, neatly packed in 20 gauge steel cases, electrically welded and built to withstand the hardest usage. The unit packages of dressings, splints and other items are so packed that they cannot shift or become disarranged.

Do you have our First Aid Materials Catalogue FA-2?

MINE SAFETY APPLIANCES COMPANY

GENERAL OFFICES: BRADDOCK, THOMAS AND MEADE STS., PITTSBURGH, PA.

District Representatives in Principal Cities

MINE SAFETY APPLIANCES CO. PITTSBURGH, PA.

M. S. A. EQUIPMENT Includes Breathing Apparatus . . . Inhalators . . . Masks of All Types . . . Gas Indicators . . . Eye and Head Protectors . . . Edison Electric Cap Lamps . . . Safety Clothing . . . First Aid Equipment . . . Descriptive Bulletins will be sent on request.

Good Roads

CHAMPION SNOW PLOWS

Will Solve Your Snow Problems

Be prepared to clear your streets and highways promptly and economically. Blade and V-type snow plows of proven design and construction. Easily attached to all makes of motor trucks. Inquiries handled immediately. Ask for Bulletins.

Model 16-D, illustrated, is a Reversible Blade-Type Plow for use with light truck equipment, 1 to 1½ tons capacity.

GOOD ROADS MACHINERY CORP.
Kennett Square, Pa.

Specialists in Truck Plows for 20 Years.

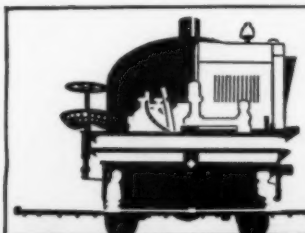
LYLE SIGNS

will help you to

—Reduce Accidents
—Beautify Your City
—Make Permanent Improvements
—Control Traffic

Write for 1933 Catalog

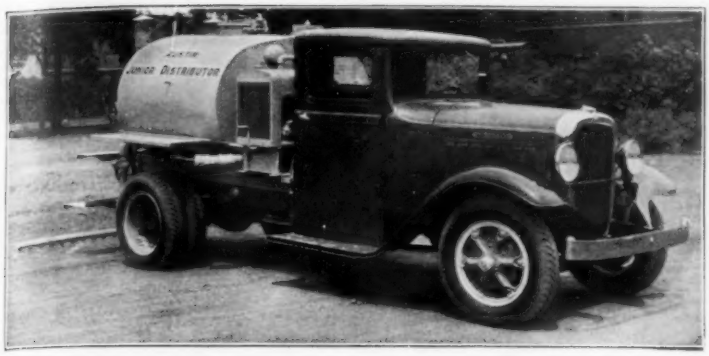
LYLE SIGNS, INC.
MINNEAPOLIS



Asphalt Distributors
Asphalt Kettles
Emulsion Sprayers
Surface Heaters
Tool Boxes
Oil Burners
Lead Furnaces

THE BACK OF A GOOD HEATER LB LITTLEFORD BROS. INC.

LITTLEFORD BROS.
500 EAST PEARL STREET
CINCINNATI, OHIO



ONE OF THE IMPROVED SERIES OF BITUMINOUS DISTRIBUTORS FOR MOUNTING ON LIGHT TRUCK CHASSIS

An Improved Series of Bituminous Distributors

The improved Austin Junior bituminous distributor for mounting on a light truck chassis has recently been announced by the Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill. In the design of this Junior line, offering capacities of 400, 500 and 600 gallons, the features of the larger Austin units have been maintained.

The pump, piping and valves are enclosed in insulated heat chambers; a water-cooled engine is used to drive the pump; the pump is provided with a cored jacket through which the exhaust from the power unit is piped, and the exhaust is also piped to the rear, where it is used for heating and blowing out the spray system. The power unit is located in front of the tank, to provide better load balance, and is protected from dirt and oil. The pump and other parts are placed so as not to hang below the truck chassis frame. Therefore, the distributor may be mounted on any truck without special alterations, and the truck may be used with dump or other body when the distributor is not needed.

Asphalt Pavement Producers Organize

The National Bituminous Pavers' Industrial Association has been formed by the asphalt pavement producers for the purpose of adopting and putting into effect a Code of Fair Practice which is in keeping with the regulations and spirit of the National Recovery Administration. To obtain self-government of the industry, eleven regional administrators or directors were appointed from the industrial leaders of the asphalt paving business. The regions and directors are as follows: Region 1, New England States, E. Sutcliffe, Vice-President, Warren Brothers Co., Boston; Region 2, New York-Pennsylvania District, William P. McDonald, President, William P. McDonald Co., New York and Lakeland, Fla.; Region 3, Central Western States, George R. Cooke, President, George R. Cooke Asphalt Paving Co., Detroit; Region 4, Middle Western States, Gilbert W. Haggart, President, Haggart Construction Co., Fargo, N. Dak.; Region 5, Northwest States, Troy Carmichael, Northwest Road Co., Portland, Ore.; Region 6, California District, Arthur F. Brough, President, Southern California Roads Co., Los Angeles; Region 7, Southwestern States, Louis S. Lang, Craven & Lang, Inc., New Orleans, La.; Region 8, Corn Belt States, Daniel J. Boone, Webb-Boone Co., St. Louis, Mo.; Region 9, South Atlantic States, George B. Carey, President, Carey-Reed Co., Birmingham, Ala.; Region 10, Southern States, Larry B. West, President, West Construction Co., Chattanooga, Tenn.; Region 11, District of Columbia and Insular Possessions, A. G. Rolfe, McGuire & Rolfe, Washington, D. C. Of these directors, the following were elected officers for the ensuing year: President, E. Sutcliffe, Vice-Presidents, William P. McDonald and Larry B. West; Secretary-Treasurer, Troy Carmichael.

Traffic Markers with Reflector Buttons Easily Installed

Traffic markers which are placed in the center of the street directly in the line of the driver's vision, where they cannot be overlooked, have been developed by the Service Foundry Co., 331-341 North Mosley Street, Wichita, Kans. Two glowing cat's-eye reflectors, securely embedded in the aluminum dome, may be seen at night for at least 600 feet. The 4-inch letters of white monel metal are cast into the base and will not rust, tarnish, or corrode, thus making a sharp contrast with the dark base of the traffic sign.

These Service traffic signs are 22 inches long and 15 inches across, with a maximum height of only 2½ inches at the center. They may be driven over at any speed with perfect safety and no inconvenience. Every part of the signs except the cat's-eye reflector is guaranteed for twenty-five years. It is claimed that these cannot be broken by traffic, but if destroyed maliciously may be replaced at 25 cents each.

It is not necessary to tear up the pavement to install these signs. All that is needed is to chip four notches ½-inch deep for the corner lugs, and drill a 2-inch hole 4 inches deep for the center bolt. The bolt head is then set in fresh concrete or old lead. The signs are carried in standard designs for immediate shipping with such wording as STOP, SLOW, DANGER, SCHOOL, ONE WAY TRAFFIC ZONES, KEEP R, No U, and No L, and other standard markings.

INSPECTING A SERVICE TRAFFIC SIGN
The man at the left is holding two traffic lane buttons

The National Municipal Incinerator Association Organized

The National Municipal Incinerator Association was formed at the Milwaukee convention of the International Association of Public Works Officials for the purpose of presenting and administering a Code of Fair Competition in the incinerator industry; also to improve the industry, foster the interests of its members, secure freedom from unlawful and unjust exactions, establish and maintain uniformity in the usage of incinerators, acquire valuable information, promote more enlarged and friendly intercourse among those engaged in the industry, and to do anything additional which may be recognized as proper and lawful purposes of trade associations.

The Association was formed with ten companies as charter members, representing more than 90 per cent of the industry, as reckoned from gross business during the past full five calendar years. It is expected that at least five more members may be added quickly.

The officers elected to serve through 1934 were: President, Ralph D. Earle, Jr., Sales Manager, Decarie Incinerator Corporation, New York; Vice-President, Richard M. Eagan, Vice-President, Hiler Engineering & Construction Co., Pittsburgh, Pa.; Secretary-Treasurer, John E. Jackson, Manager, Incinerator Dept., Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa. All these men serve on an Executive Committee with Herbert A. Hershey, Vice-President, C. O. Bartlett Snow Co., Cleveland, Ohio, Russell E. Dean, President, Morse-Boulger Destructor Co., New York, and A. C. Felton, Jr., President, Nye Odorless Incinerator Co., Macon, Ga. For the present, the headquarters of the Association will be at the office of the President, 155 East 44th Street, New York.

"Welcome to our city"

How does *your* street lighting say it?

What impression does *your* city make on the visitor who sees it at night for the first time? Does he see a gloomy, stagnant "nine-o'clock town," or is he greeted by the cheerful glow of well-lighted streets—streets bustling with life and color and activity? ¶ That visitor may be an important out-of-town buyer... a prospective resident... or the head of an industry seeking a location. His judgment of your city may be materially affected by its nighttime appearance. ¶ Good street lighting pays dividends in increased business... decreased accidents... fewer crimes... faster-moving traffic. But the installation of street lighting brings difficult problems as to planning, selection of standards, original costs and maintenance cost... Graybar's lighting specialists have both the wide experience and the ready willingness to help you solve just such problems.

GraybaR
STREET LIGHTING

OFFICES IN 73 PRINCIPAL CITIES. EXECUTIVE OFFICES: GRAYBAR BUILDING, NEW YORK, N. Y.

Do you mention THE AMERICAN CITY? Please do.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

New Bridge and Viaduct at Westfield, Massachusetts

By ROBERT B. ELY
Illuminating Engineer, Westinghouse Electric & Manufacturing Company, Boston, Mass.

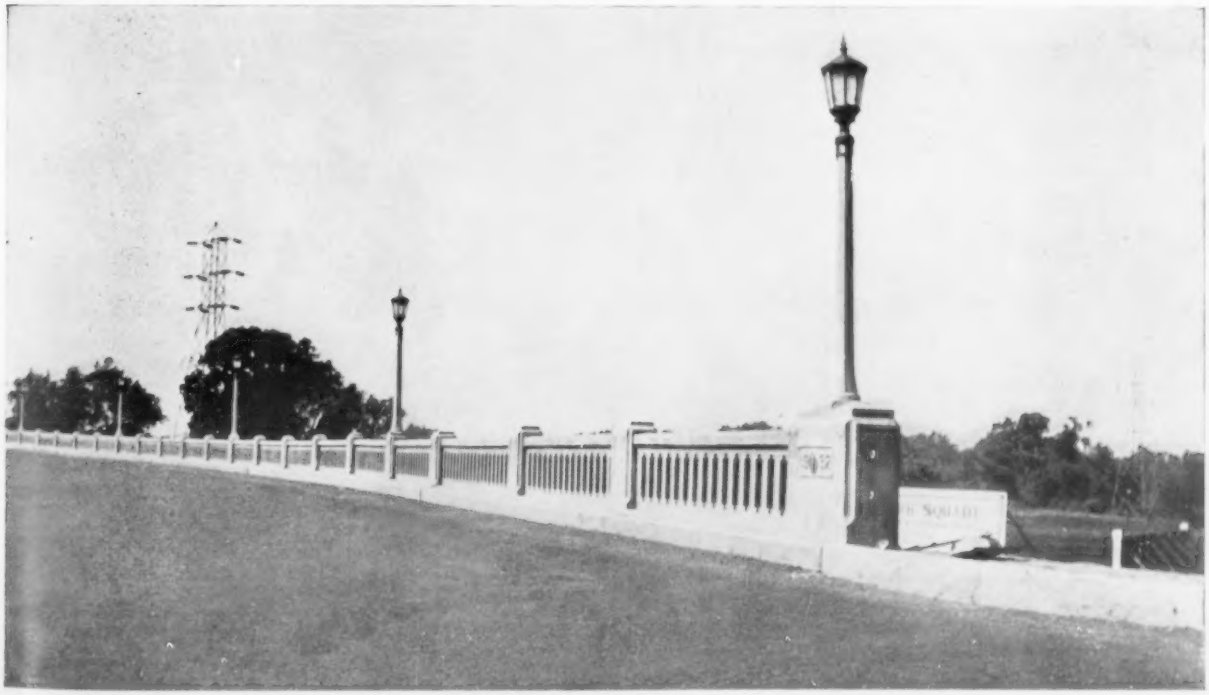
THE development of new and improved highways in the state of Massachusetts has made it desirable to replace some of the old bridge structures and eliminate steep winding grades and curves. One of the most recent highway improvements of this nature has taken place on U. S. Highway No. 20 at Powder Mill Brook. It was necessary to raise the grade at this location on account of the flooding of the roadway during spring freshets.

The bridge is now approached by the construction of a viaduct of concrete construction and a new steel bridge, designed by the Department of Public Works of the state of Massachusetts under the direction of Mr. Harkness and Mr. Spofford. Through the cooperative efforts of the Public Works Department and the city of Westfield, Clarence Kinard, Superintendent of the Electric Light Department, planned the lighting of the bridge and viaduct, and the plans were incorporated in the design of the structure, resulting in an effective and harmonious lighting installation.

The installation consists of Hollowspun granite standards on the concrete viaduct, and cast iron newels and brackets on the bridge, this equipment being in harmony with the construction material employed.

All lighting units are of the Octagonal Jr. design. Those on the viaduct and the bridge approaches are in the upright position, and pendant units are used on the bridge. All lamps are of 4,000 lumens excepting the eight approach lamps, which are spaced about 50 feet apart and are 2,500-lumen.

The unique feature of the installation is the method employed in setting the Hollowspun standards and providing handholes for pulling cable. Hollowspun



VIADUCT OF THE NEW WESTFIELD BRIDGE

HOW

22 Cities Saved Money by Spending It and 20 Others Lost Money by Saving It

THE Travelers Insurance Company broadened the scope of its 1931 survey of the relation between street lighting and night traffic accidents. From 46 cities it was expanded to cover 227 cities with a total population of over 40 millions. A comparison of returns from 42 cities reporting for both 1931 and 1932 brought out these startling facts:

22 CITIES WITH INCREASED STREET-LIGHTING BUDGETS SAVED BY SPENDING		20 CITIES WITH DECREASED STREET-LIGHTING BUDGETS LOST BY SAVING	
Total population	15,358,000	Total population	5,618,000
Amount increase in street-lighting costs	$1,429,321	Amount decrease in street-lighting costs	$1,101,389
Increased cost, per capita	$0.093	*Decreased cost, per capita*	$0.19
Automobile fatalities during hours of darkness		Automobile fatalities during hours of darkness	
1931	1,648	1931	641
1932	1,255	1932	689
Per cent decrease	23.8	Per cent increase	7.4
Total automobile accidents during hours of darkness		Total automobile accidents during hours of darkness	
1931	44,496	1931	17,307
1932	33,885	1932	18,603
Per cent decrease	23.8	Per cent increase	7.4
Economic saving	$31,833,000	Excess economic cost	$3,888,000
Economic saving, per capita	$2.07	*Excess economic cost, per capita*	$0.69

The figures speak for themselves. General Electric illuminating engineers will gladly help your city to plan a comprehensive street-lighting program, which may be completed in one, five, or any number of years.

If you wish the services of these engineers or a complete summary of the survey mentioned on this page, GED-577, write General Electric, Dept. 6-201, Schenectady, N. Y.

NRA

720-205

GENERAL ELECTRIC

TYPICAL VIADUCT STANDARD

standards with monolithic foundation sections were provided. Wooden boxes were constructed to allow sufficient space to serve as a pull box and placed over the fiber ducts. Bronze collars and door were set in position in the form to provide entrance to the pull box space. The standards were then mounted on the wooden box within the form, and the concrete was poured. This method of construction eliminated all foundation bolts and all exposed metal parts about the base of the standards, which avoids any possibility of staining the concrete due to rust or corrosion of exposed metal parts.

The density of the Hollowspun granite standard, being greater than the density that can be obtained by the tamping process, assures long life and more reasonable cost as compared with the building of forms and casting standards with the balustrade.

This is but one of the many improvements that have been made in the city of Westfield under the progressive leadership of the municipal authorities.

Over a period of five years the street-lighting system has been practically replaced with modern equipment and the illumination greatly increased. Today the business section is one of the outstanding examples of high-intensity street lighting in western Massachusetts.

The highway leading west from the city has been relighted during the past year. The highway leading east to the viaduct, although lighted at present, will be improved at some future date.

The improved lighting of the street has definitely resulted in a betterment to the entire community and, in addition, it invites the passing traveler to stop and visit the stores, cafés and hotels.

BRIDGE NEWEL ON PILASTER

The Illumination of Golf Courses

Night Golf Has Proved Practical—Lighting Attracts Spectators and Players

NOTICE HOW THE GREEN STANDS OUT UNDER THE FLOODLIGHTING

GENERAL ILLUMINATION ENGINEERING CO.

Cincinnati, Ohio · · · · · · Carew Tower

STREET LIGHTING
- ZONING SURVEYS
- ILLUMINATION ANALYSIS
- ELEC. RECOMMENDATIONS
- VALUATION APPRAISALS
- RATE ADMINISTRATION
- CONTRACT SUPERVISION

FLOODLIGHTING
- AIRPORT
- ARCHITECTURAL
- DISPLAY
- INDUSTRIAL
- RECREATIONAL

THE LITEINDEX

At the recent Illuminating Engineering Society convention there was presented the new Liteindex—exclusive with General Illumination Engineers, making available for the first time a method by which Seeing Ability—the final test of the value of any street lighting system, may be accurately predetermined. Details of our complete service, involving every phase of street lighting," will be sent on request. General Illumination Engineering Co.

LIGHTING EXPERTS SELLING NOTHING BUT SERVICE

GET A BETTER JOB AT LESS COST

With Hotstuf TRADE MARK

WRITE US FOR BULLETINS

MAINTENANCE EQUIPMENT
ASPHALT HEATERS
TOOL & SURFACE HEATERS
WEED BURNERS
TRAILER TOOL BOXES FOR SERVICE DEPARTMENTS

MOHAWK ASPHALT HEATER CO.
Frankfort New York

"HVASS" SPREADERS

Conquer Slippery Pavements

Spread full width street or road at one time or any part thereof.

—SPREAD—
SAND, ASHES OR CINDERS

Can be quickly attached or detached.
Write for descriptive bulletin.

CHAS. HVASS & CO., Inc. 508 East 19th Street, New York City

Portable Asphalt Maintenance Plants

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

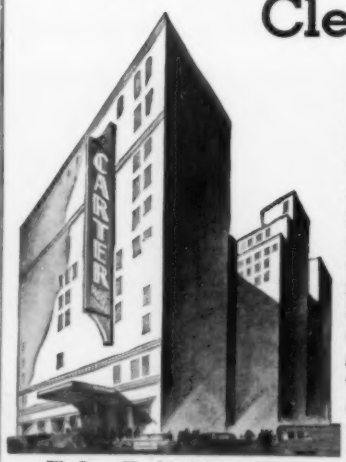
ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

Send for Bulletin R-400

HETHERINGTON & BERNER INC.
INDIANAPOLIS, IND.

Stationary — Railway — Portable and Semi-Portable Plants

When You Come to Cleveland



The Carter Hotel, in the heart of Cleveland is conveniently located close to leading department stores, theatres, banks and transportation terminals.

Room Rates Begin at $2.50

When next you visit Cleveland come to the New Carter Hotel. A warm welcome awaits you—prompt, courteous service and delicious food at reasonable prices. Six hundred large, comfortable outside rooms each with private bath and circulating ice water. Exceptional facilities for conventions and sales meetings. Personalized management.

The CARTER HOTEL
PROSPECT NEAR EAST NINTH
CLEVELAND, OHIO
FOLSOM B. TAYLOR, Managing Director

Carey Elastite EXPANSION JOINT

makes *Good* Paving *Better*

The "sandwich" joint which protects concrete paving against expansion and contraction stresses. Proved by 20 years' use in highways and sidewalks in all parts of the world. Large stocks in principal cities insure immediate shipment. Write for catalog and 1933 prices.

THE PHILIP CAREY COMPANY
Department E-1 Lockland, Cincinnati, Ohio
Branches in Principal Cities

Cents, $2 a Year

NOVEMBER, 1933

NOV 14 1933

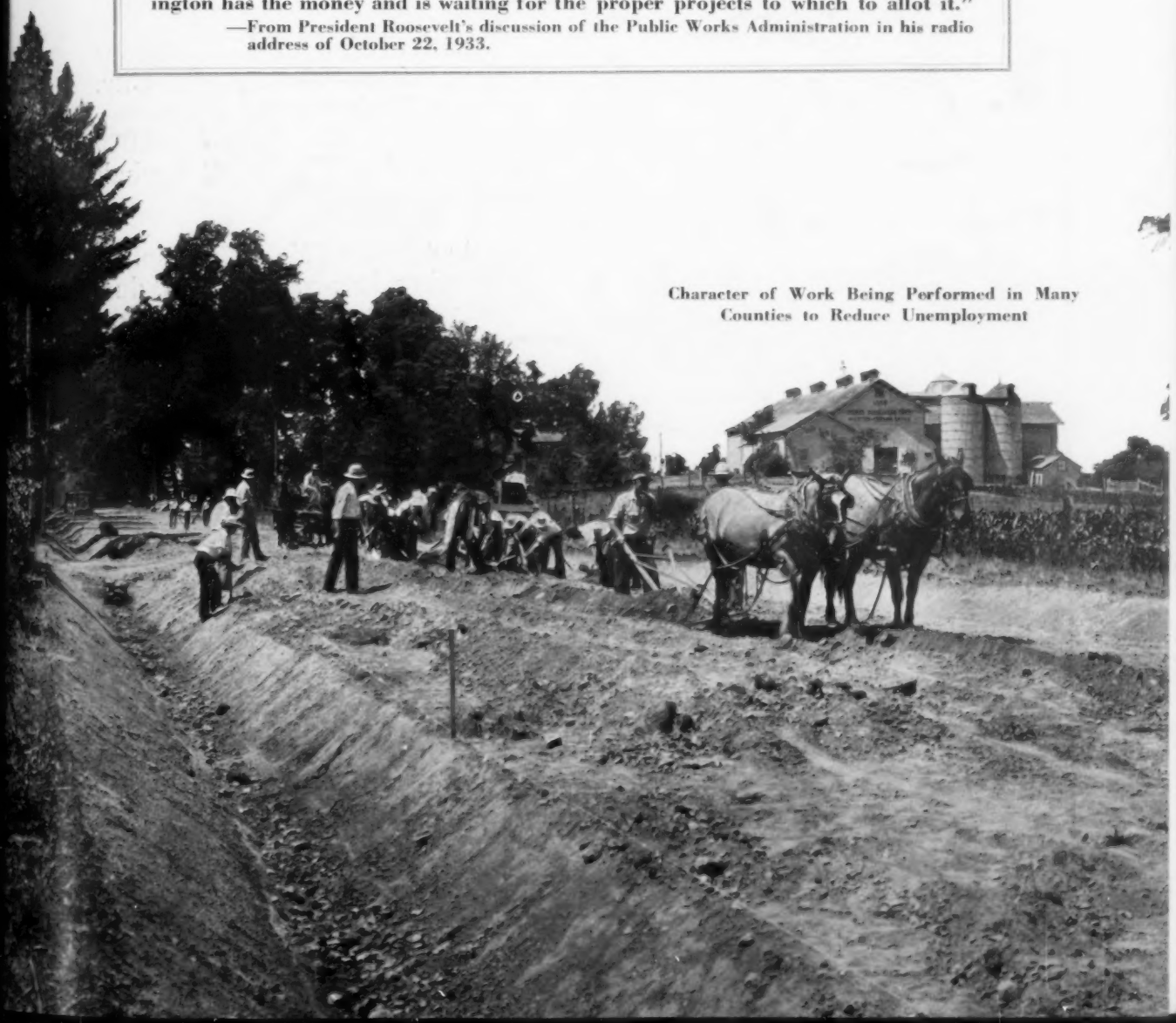
PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

The American City

Have Your City and County Applied for PWA Funds?

"Out of a total appropriated for public works of $3,300,000,000 . . . about $1,200,000,000, nearly all of it intended for state or local projects, waits only on the presentation of proper projects by the states and localities themselves. Washington has the money and is waiting for the proper projects to which to allot it."

—From President Roosevelt's discussion of the Public Works Administration in his radio address of October 22, 1933.



Character of Work Being Performed in Many Counties to Reduce Unemployment